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Kikuchi

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(54) **PRINTING APPARATUS, CONTROL METHOD THEREOF, AND STORAGE MEDIUM**

(71) Applicant: **CANON KABUSHIKI KAISHA**, Tokyo (JP)

(72) Inventor: **Shou Kikuchi**, Kawasaki (JP)

(73) Assignee: **CANON KABUSHIKI KAISHA**, Tokyo (JP)

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G06F 15/00 (2006.01)
G06F 3/12 (2006.01)
G06K 15/02 (2006.01)

(52) **U.S. Cl.**
CPC ***G06F 3/1296*** (2013.01); ***G06F 3/1203*** (2013.01); ***G06F 3/1211*** (2013.01); ***G06F 3/1262*** (2013.01); ***G06F 3/1263*** (2013.01); ***G06F 3/1285*** (2013.01); ***G06K 15/1809*** (2013.01); *G06F 3/1264* (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

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Primary Examiner — Helen Q Zong
(74) *Attorney, Agent, or Firm* — Fitzpatrick, Cella, Harper & Scinto

(57) **ABSTRACT**

When a printing apparatus according to one aspect of this invention newly accepts a print job other than a specific job, for which guarantee of the print order is set as a print setting, during execution of print order guarantee for inhibiting execution of a print job other than the specific job and executing specific jobs in the acceptance order, it executes interrupt print processing to execute the print job under a predetermined condition. If the print settings of the print job do not include a setting which disturbs output of a printed material complying with the print settings of a specific job in progress by the print order guarantee, the printing apparatus executes the print job by interrupt processing.

7 Claims, 16 Drawing Sheets

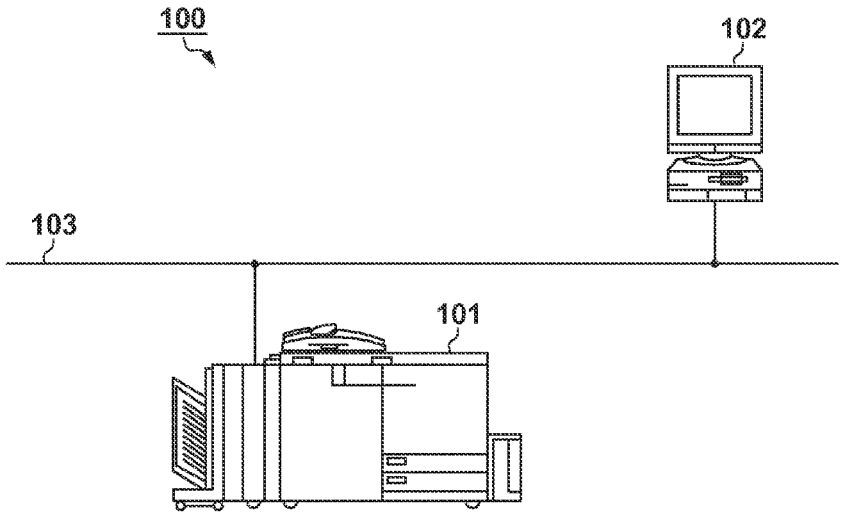


FIG. 1

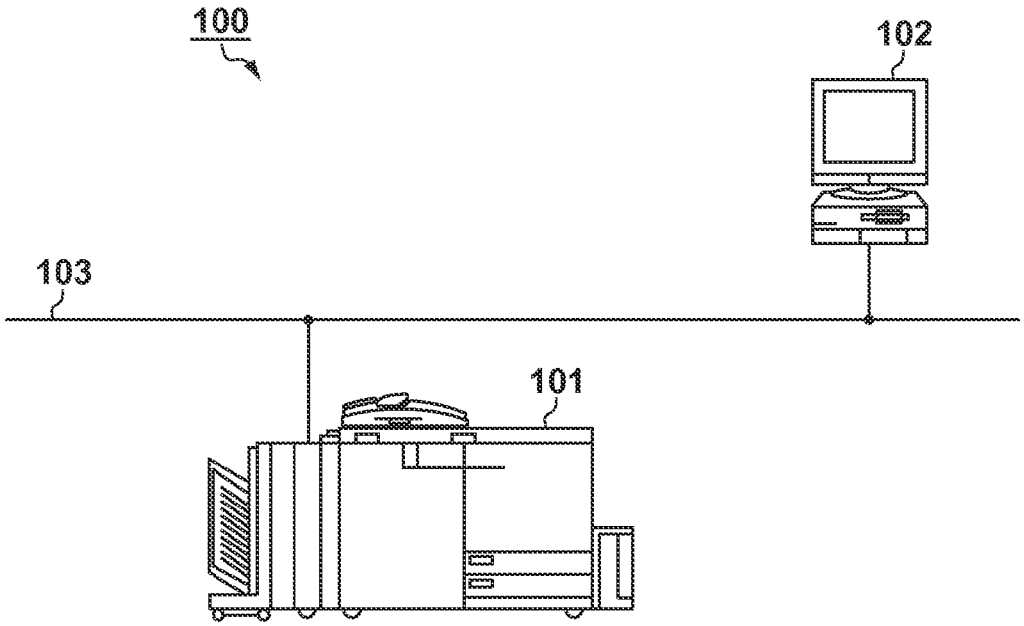


FIG. 2

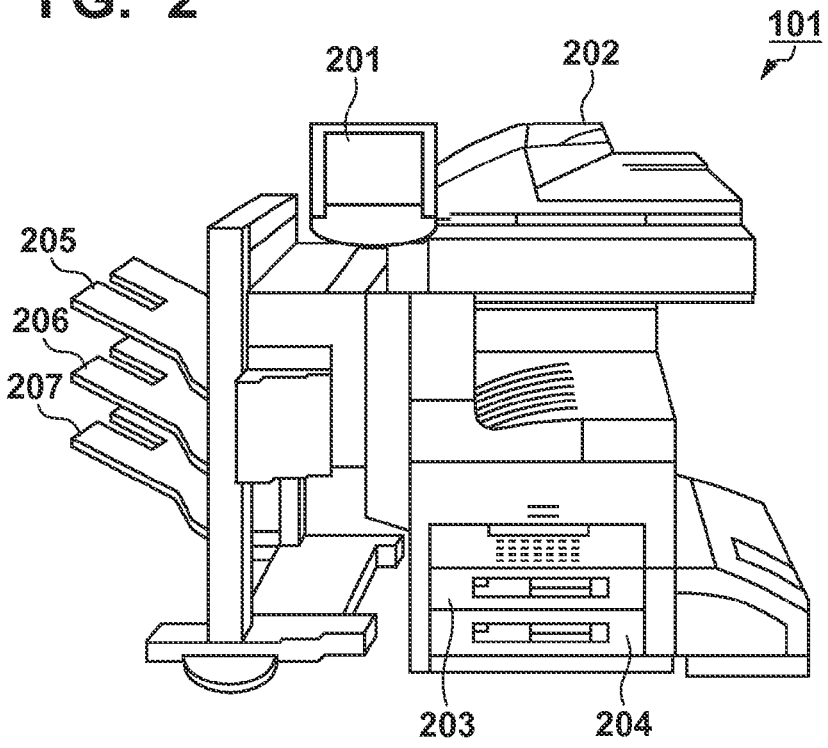


FIG. 3

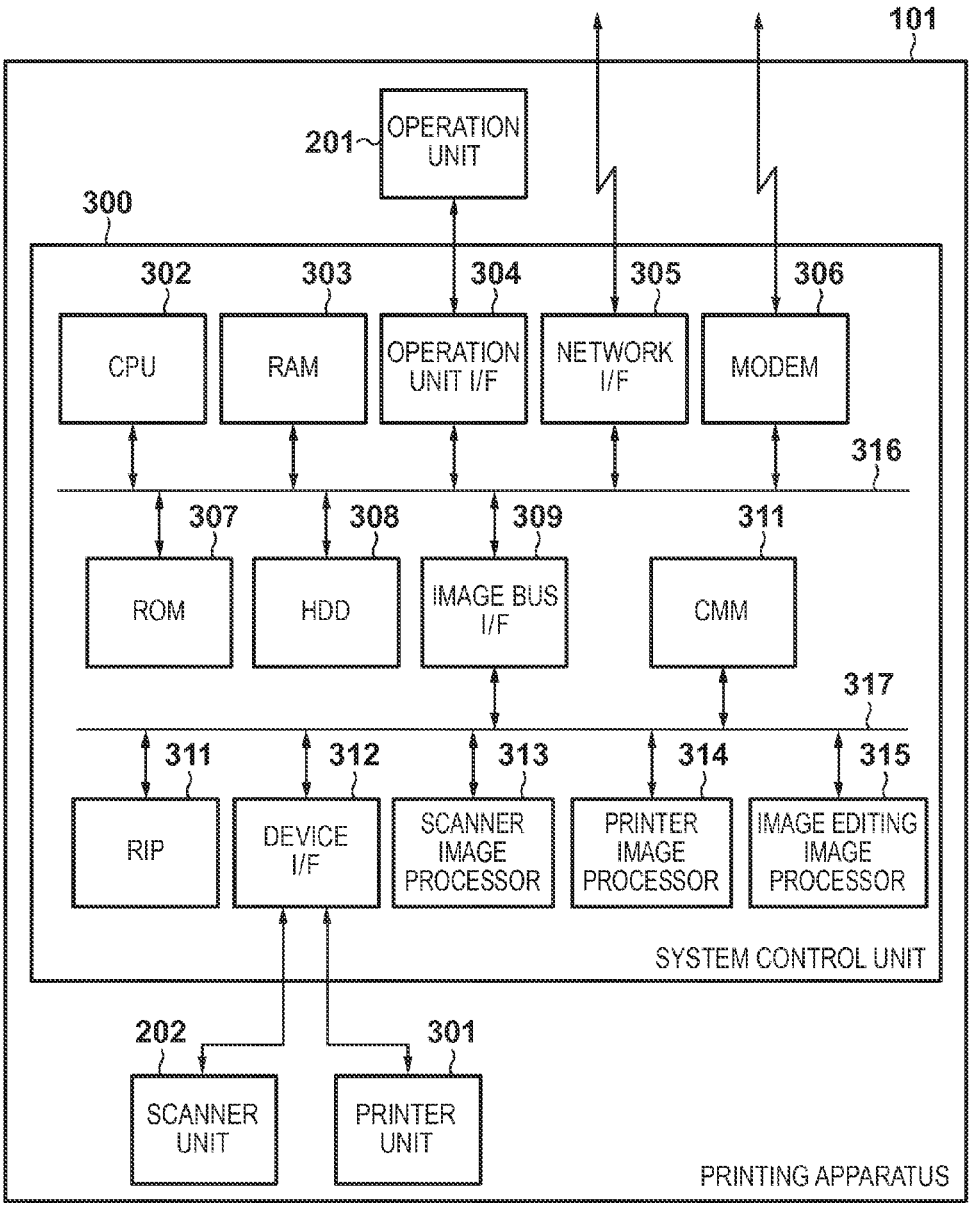

101
201
OPERATION UNIT
300
302
303
304
305
306
CPU
RAM
OPERATION UNIT I/F
NETWORK I/F
MODEM
316
307
308
309
311
ROM
HDD
IMAGE BUS I/F
CMM
317
311
312
313
314
315
RIP
DEVICE I/F
SCANNER IMAGE PROCESSOR
PRINTER IMAGE PROCESSOR
IMAGE EDITING IMAGE PROCESSOR
SYSTEM CONTROL UNIT
202
301
SCANNER UNIT
PRINTER UNIT
PRINTING APPARATUS

FIG. 4

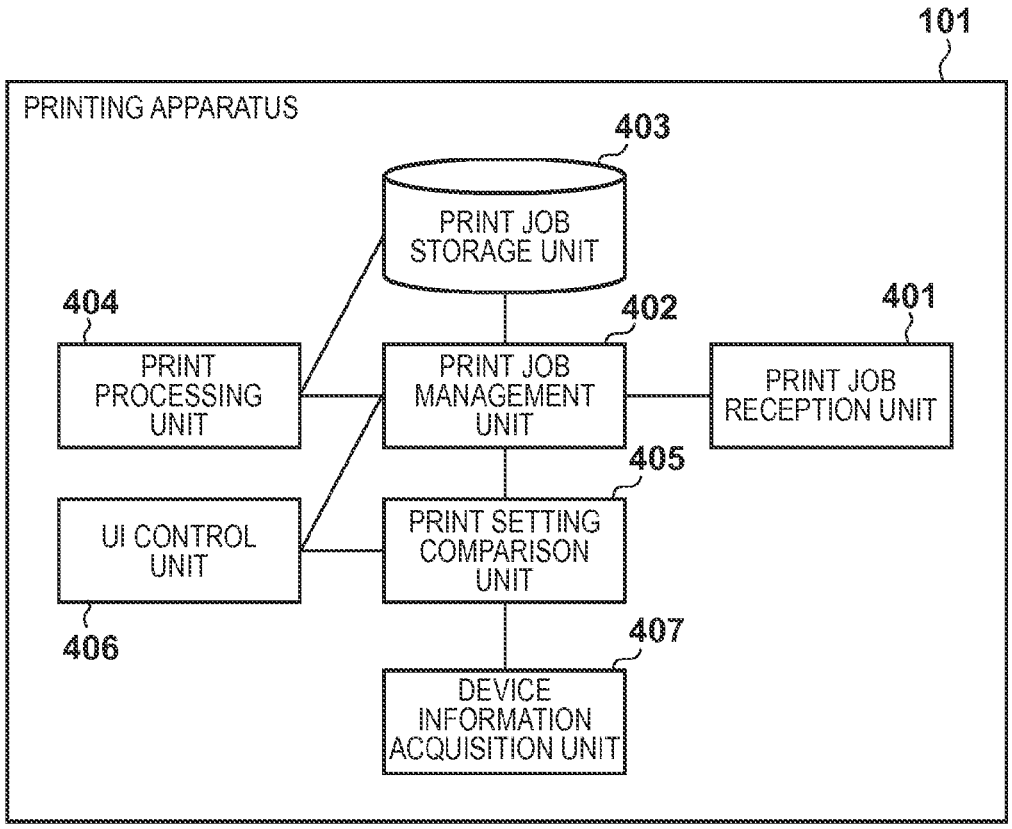

101
PRINTING APPARATUS
403
PRINT JOB STORAGE UNIT
404
PRINT PROCESSING UNIT
402
PRINT JOB MANAGEMENT UNIT
401
PRINT JOB RECEPTION UNIT
405
PRINT SETTING COMPARISON UNIT
UI CONTROL UNIT
406
407
DEVICE INFORMATION ACQUISITION UNIT

FIG. 5

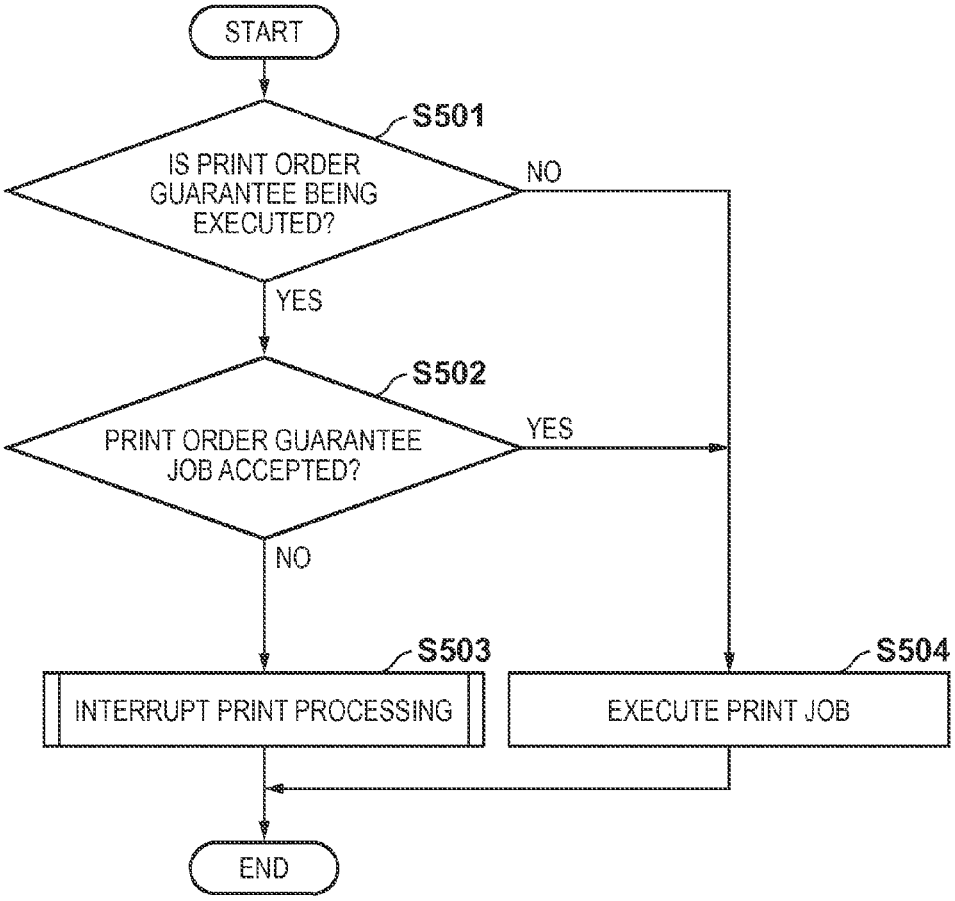

START
S501
IS PRINT ORDER GUARANTEE BEING EXECUTED?
NO
YES
S502
PRINT ORDER GUARANTEE JOB ACCEPTED?
YES
NO
S503
INTERRUPT PRINT PROCESSING
S504
EXECUTE PRINT JOB
END

FIG. 6

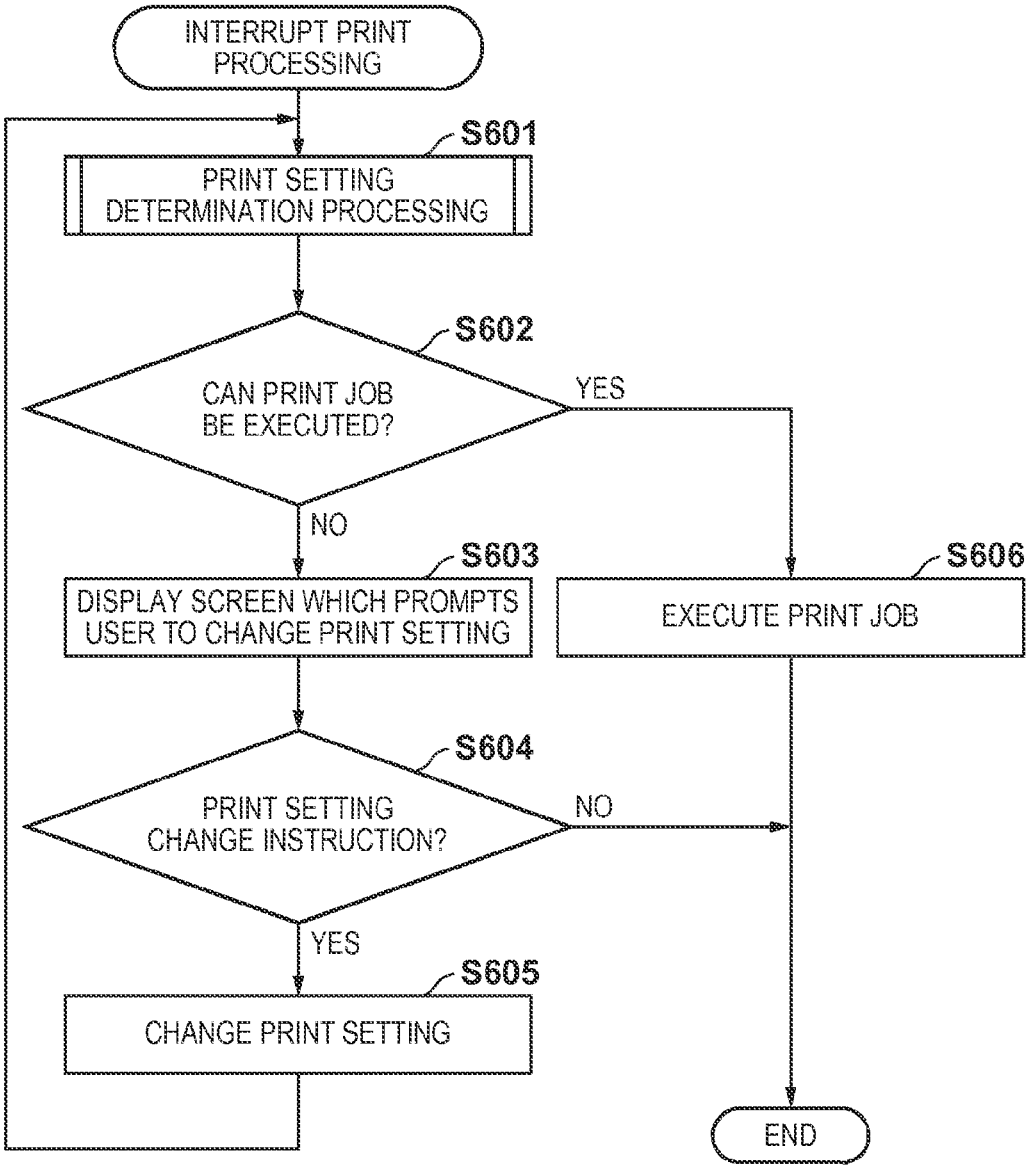

INTERRUPT PRINT PROCESSING
S601
PRINT SETTING DETERMINATION PROCESSING
S602
CAN PRINT JOB BE EXECUTED?
YES
NO
S603
DISPLAY SCREEN WHICH PROMPTS USER TO CHANGE PRINT SETTING
S606
EXECUTE PRINT JOB
S604
PRINT SETTING CHANGE INSTRUCTION?
NO
YES
S605
CHANGE PRINT SETTING
END

FIG. 7

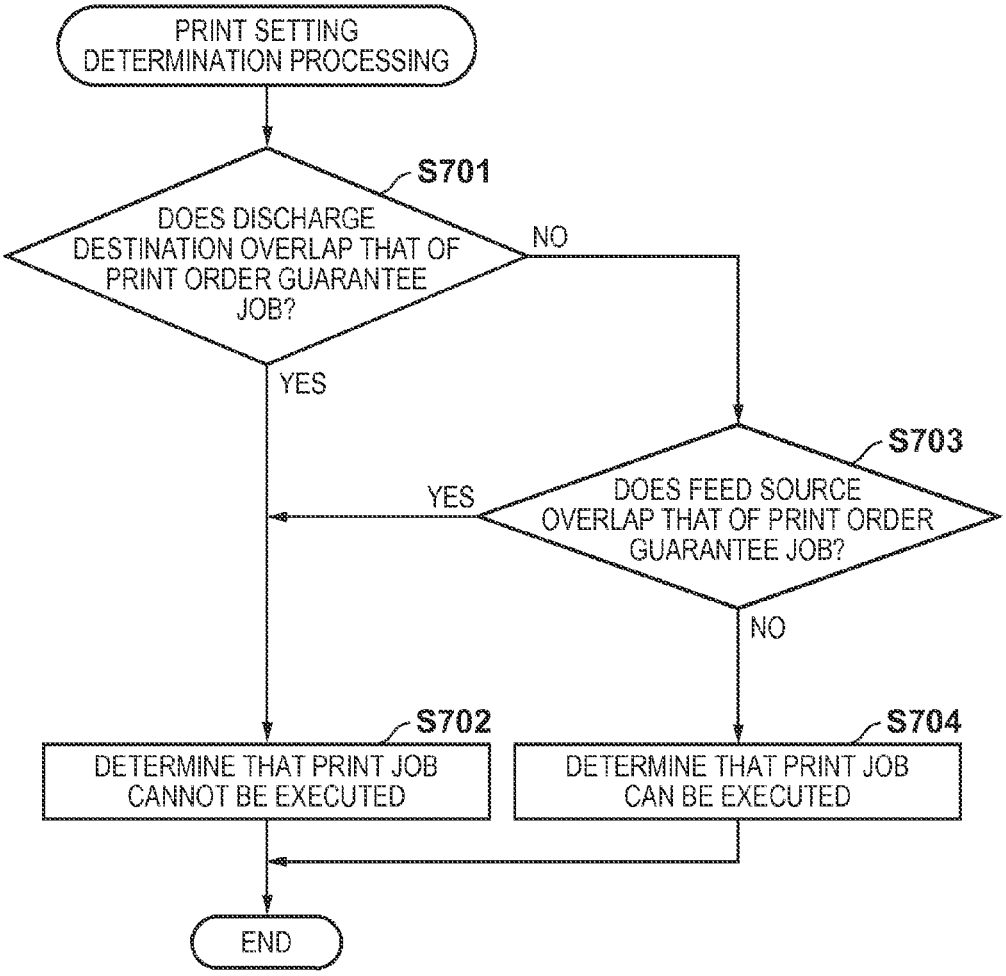

PRINT SETTING DETERMINATION PROCESSING
S701
DOES DISCHARGE DESTINATION OVERLAP THAT OF PRINT ORDER GUARANTEE JOB?
NO
YES
S703
DOES FEED SOURCE OVERLAP THAT OF PRINT ORDER GUARANTEE JOB?
YES
NO
S702
DETERMINE THAT PRINT JOB CANNOT BE EXECUTED
S704
DETERMINE THAT PRINT JOB CAN BE EXECUTED
END

FIG. 8

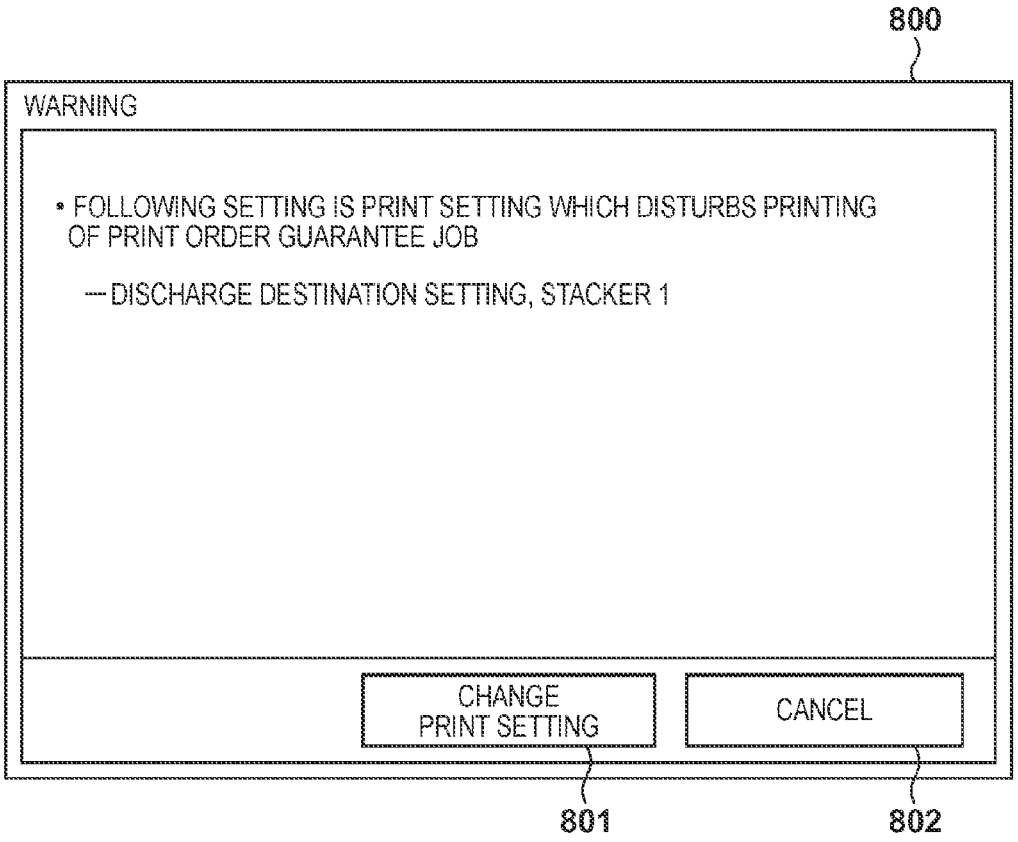

800
WARNING
• FOLLOWING SETTING IS PRINT SETTING WHICH DISTURBS PRINTING OF PRINT ORDER GUARANTEE JOB
— DISCHARGE DESTINATION SETTING, STACKER 1
CHANGE PRINT SETTING
CANCEL
801
802

FIG. 9

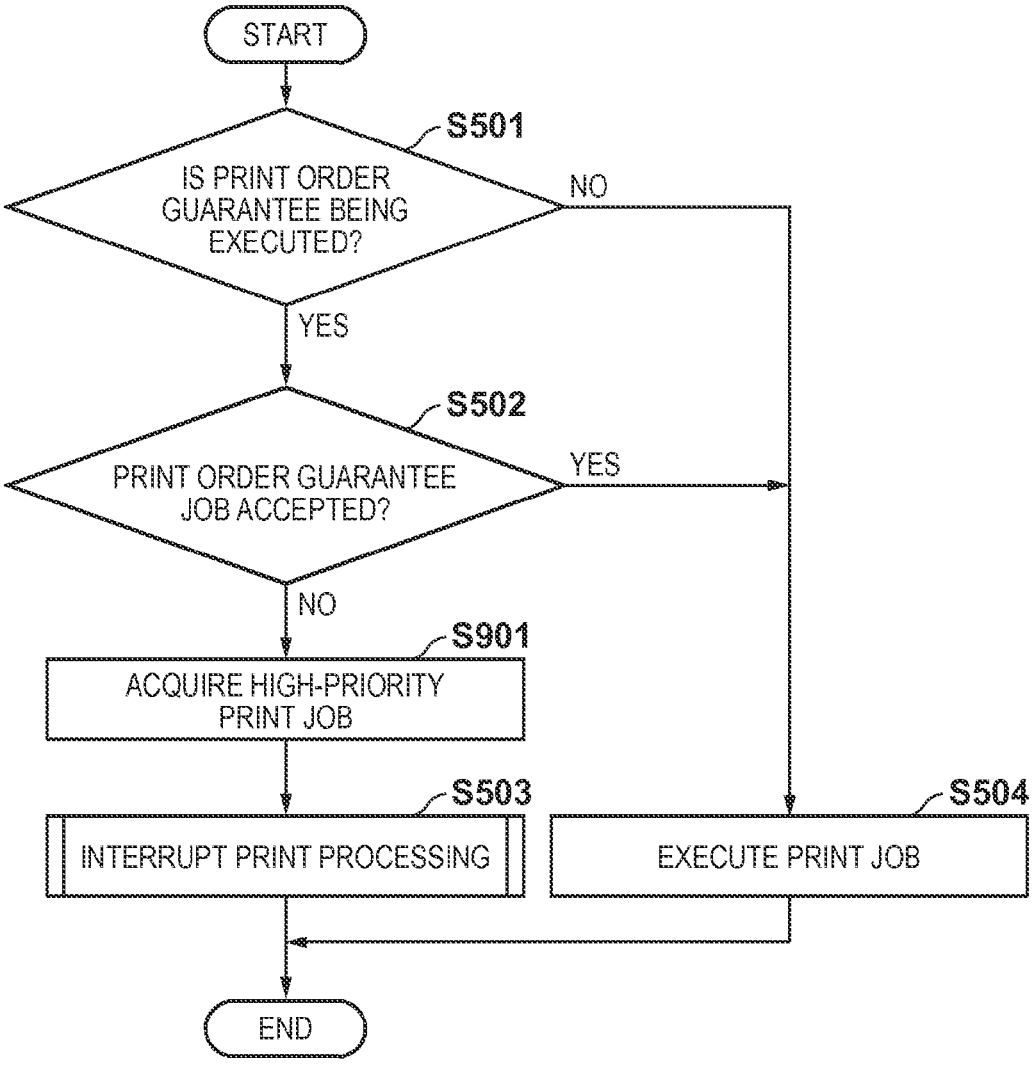

START
S501
IS PRINT ORDER GUARANTEE BEING EXECUTED?
NO
YES
S502
PRINT ORDER GUARANTEE JOB ACCEPTED?
YES
NO
S901
ACQUIRE HIGH-PRIORITY PRINT JOB
S503
INTERRUPT PRINT PROCESSING
S504
EXECUTE PRINT JOB
END

FIG. 10

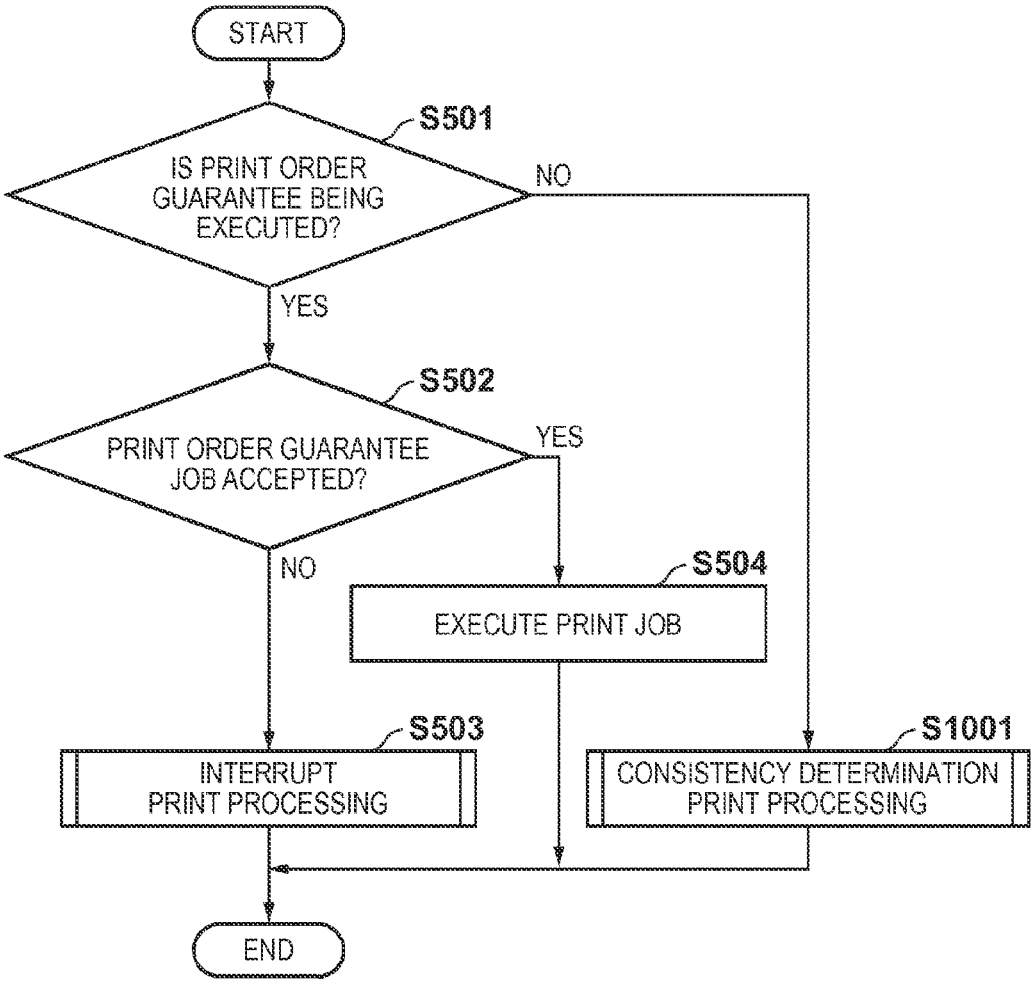

START
S501
IS PRINT ORDER GUARANTEE BEING EXECUTED?
NO
YES
S502
PRINT ORDER GUARANTEE JOB ACCEPTED?
YES
NO
S504
EXECUTE PRINT JOB
S503
INTERRUPT PRINT PROCESSING
S1001
CONSISTENCY DETERMINATION PRINT PROCESSING
END

FIG. 11

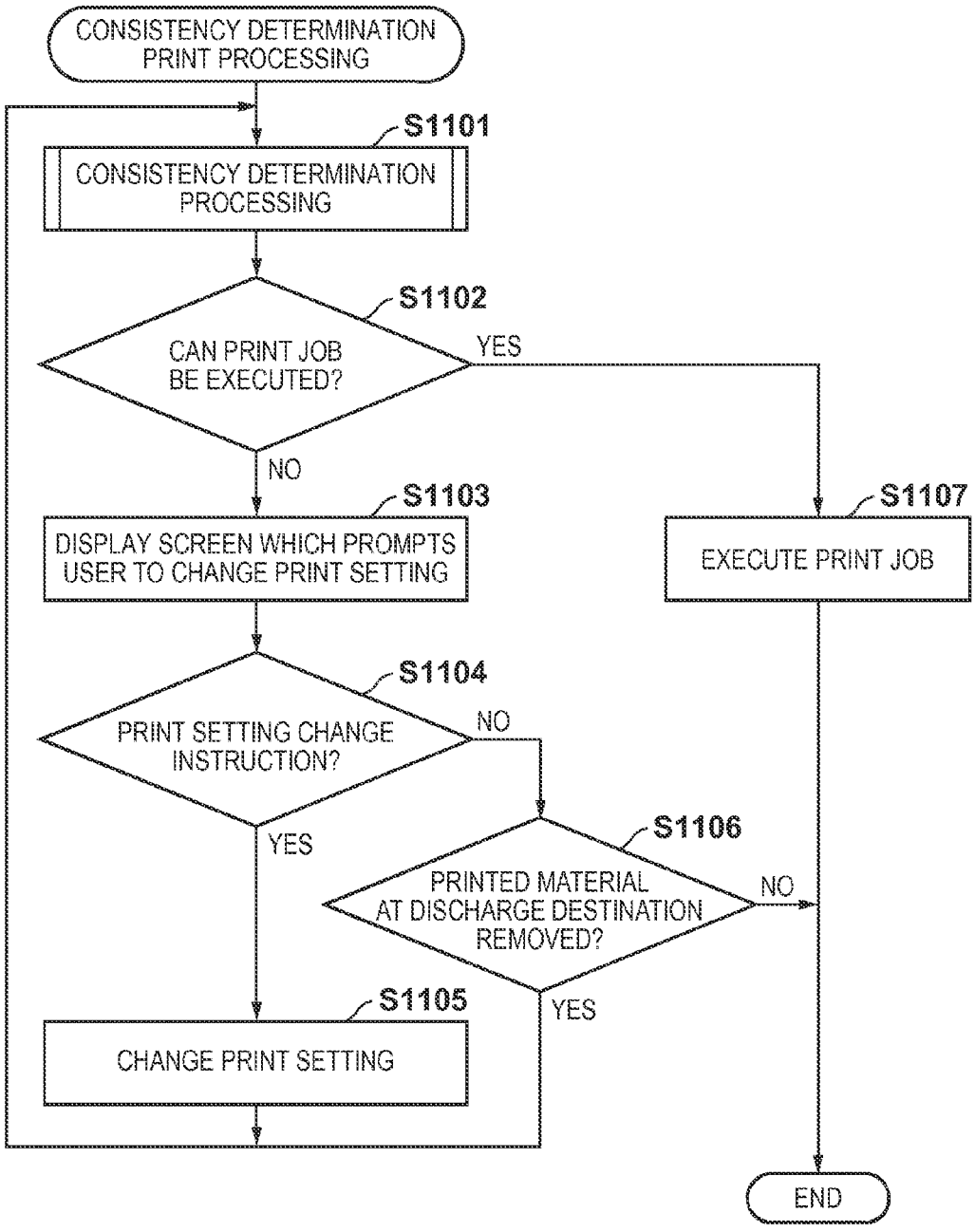

CONSISTENCY DETERMINATION PRINT PROCESSING
S1101
CONSISTENCY DETERMINATION PROCESSING
S1102
CAN PRINT JOB BE EXECUTED?
YES
NO
S1103
DISPLAY SCREEN WHICH PROMPTS USER TO CHANGE PRINT SETTING
S1107
EXECUTE PRINT JOB
S1104
PRINT SETTING CHANGE INSTRUCTION?
NO
YES
S1106
PRINTED MATERIAL AT DISCHARGE DESTINATION REMOVED?
NO
YES
S1105
CHANGE PRINT SETTING
END

FIG. 12

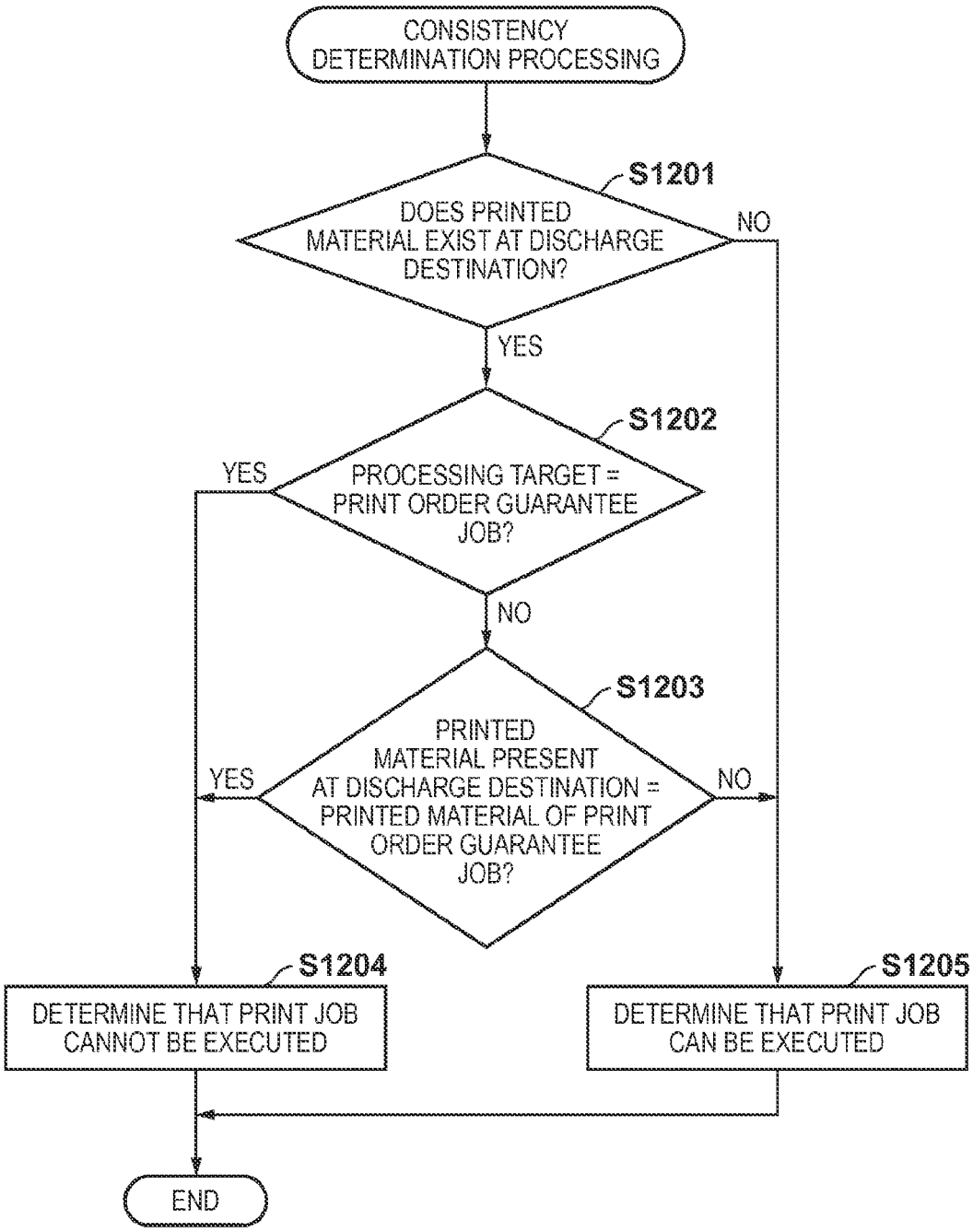

CONSISTENCY DETERMINATION PROCESSING
S1201
DOES PRINTED MATERIAL EXIST AT DISCHARGE DESTINATION?
NO
YES
S1202
PROCESSING TARGET = PRINT ORDER GUARANTEE JOB?
YES
NO
S1203
PRINTED MATERIAL PRESENT AT DISCHARGE DESTINATION = PRINTED MATERIAL OF PRINT ORDER GUARANTEE JOB?
YES
NO
S1204
DETERMINE THAT PRINT JOB CANNOT BE EXECUTED
S1205
DETERMINE THAT PRINT JOB CAN BE EXECUTED
END

FIG. 13

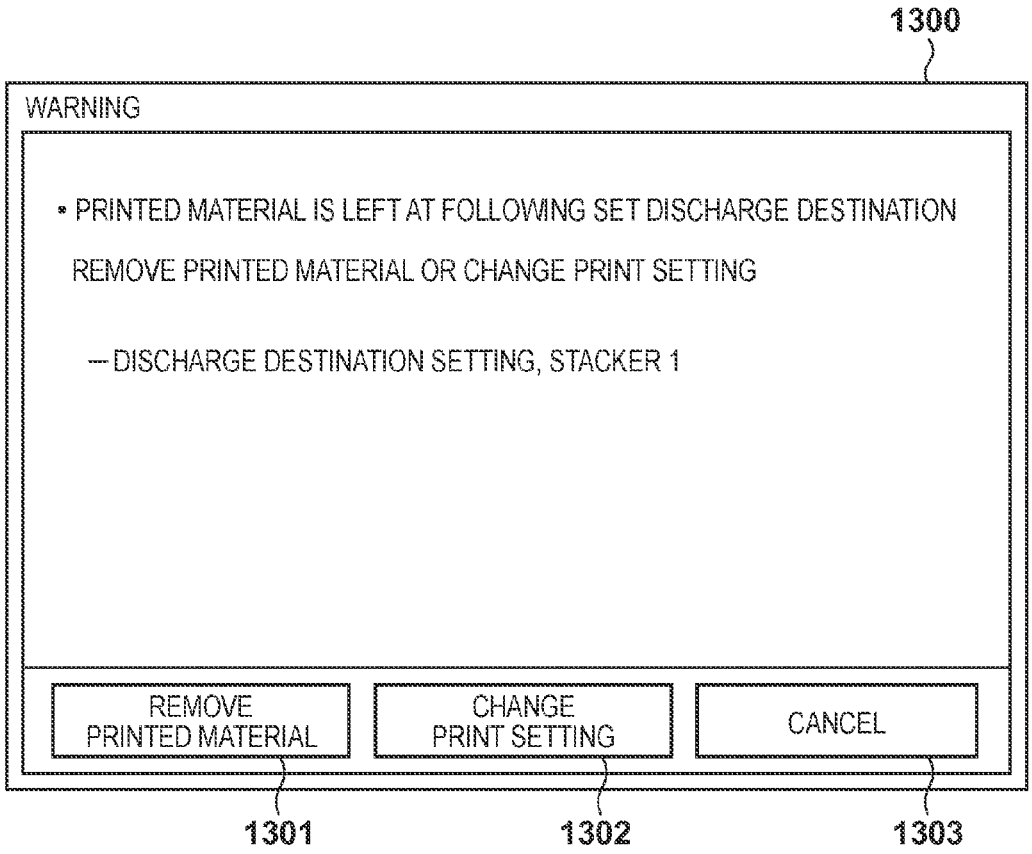

1300
WARNING
• PRINTED MATERIAL IS LEFT AT FOLLOWING SET DISCHARGE DESTINATION
REMOVE PRINTED MATERIAL OR CHANGE PRINT SETTING
— DISCHARGE DESTINATION SETTING, STACKER 1
REMOVE PRINTED MATERIAL
CHANGE PRINT SETTING
CANCEL
1301
1302
1303

FIG. 14

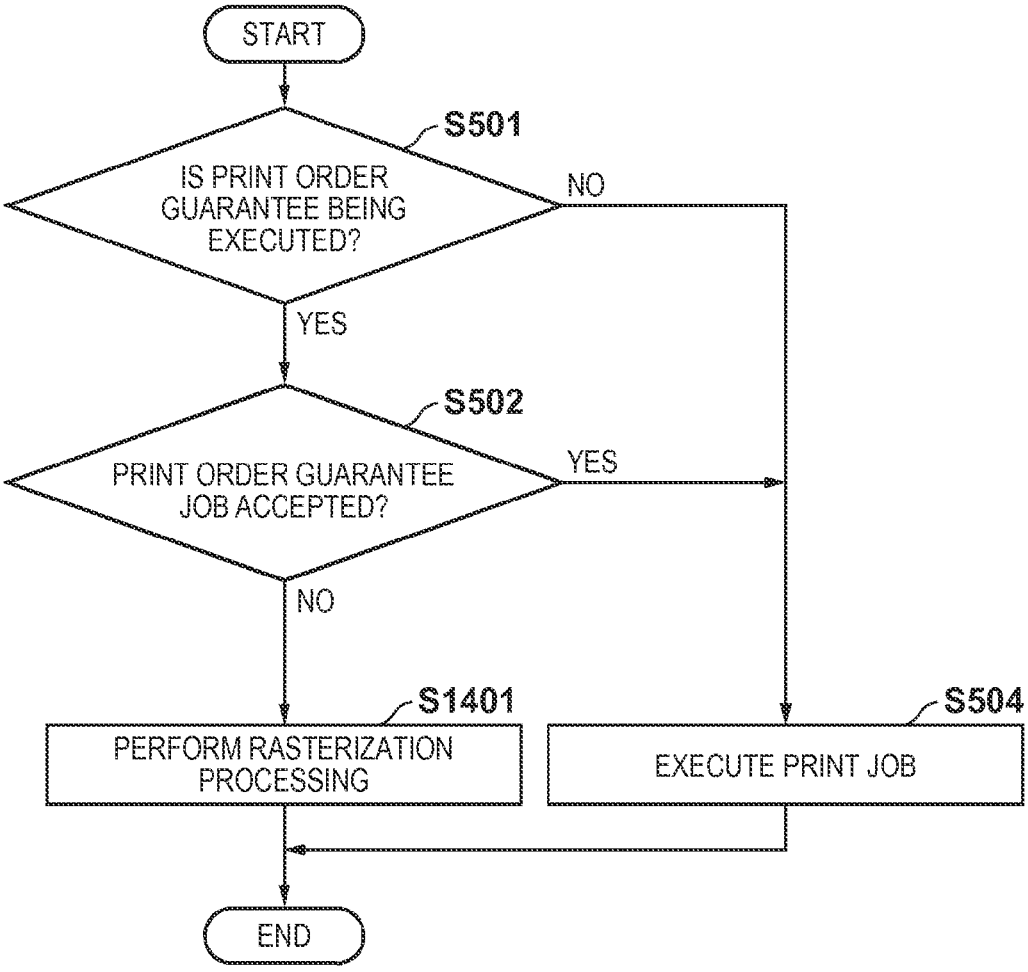

START
S501
IS PRINT ORDER GUARANTEE BEING EXECUTED?
NO
YES
S502
PRINT ORDER GUARANTEE JOB ACCEPTED?
YES
NO
S1401
PERFORM RASTERIZATION PROCESSING
S504
EXECUTE PRINT JOB
END

FIG. 15

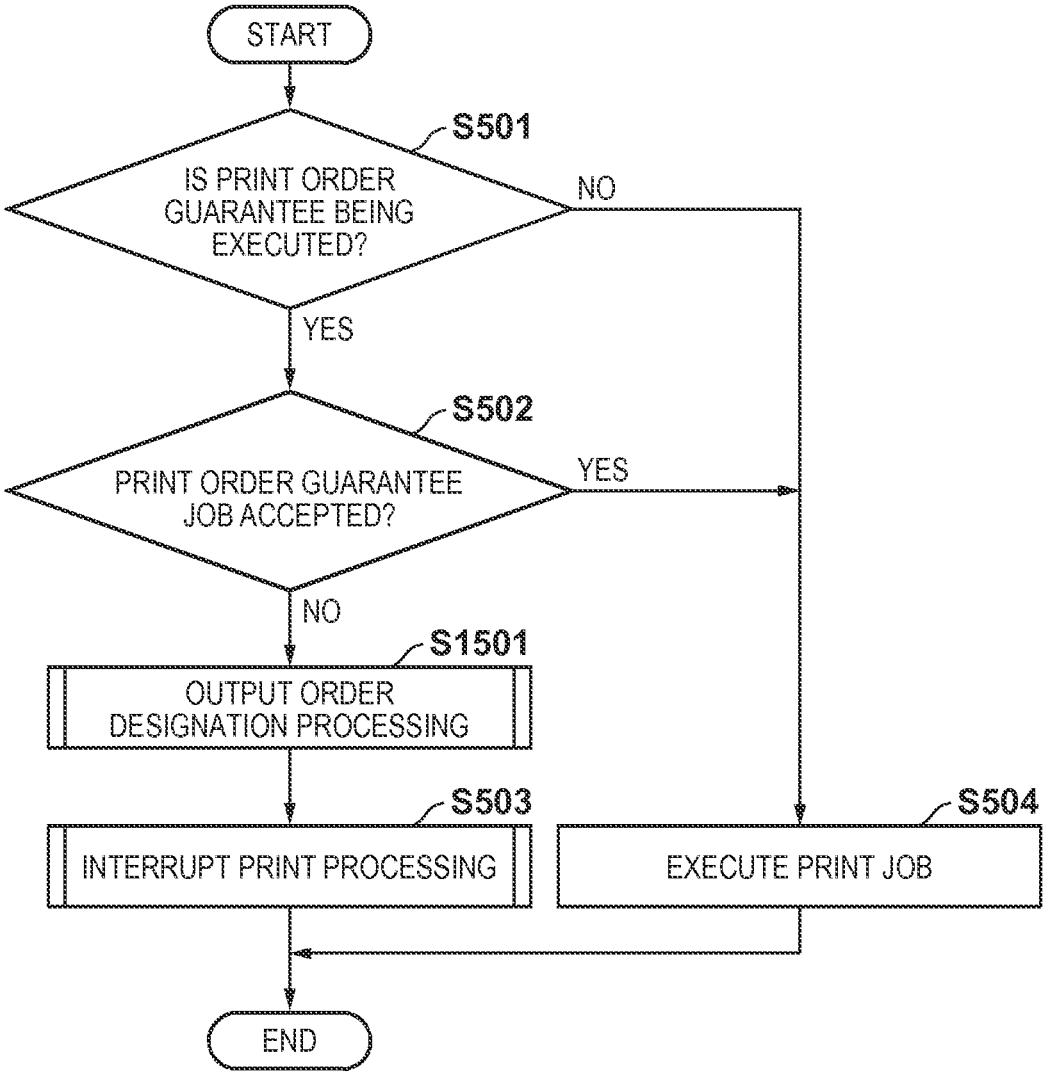

START
S501
IS PRINT ORDER GUARANTEE BEING EXECUTED?
NO
YES
S502
PRINT ORDER GUARANTEE JOB ACCEPTED?
YES
NO
S1501
OUTPUT ORDER DESIGNATION PROCESSING
S503
INTERRUPT PRINT PROCESSING
S504
EXECUTE PRINT JOB
END

FIG. 16

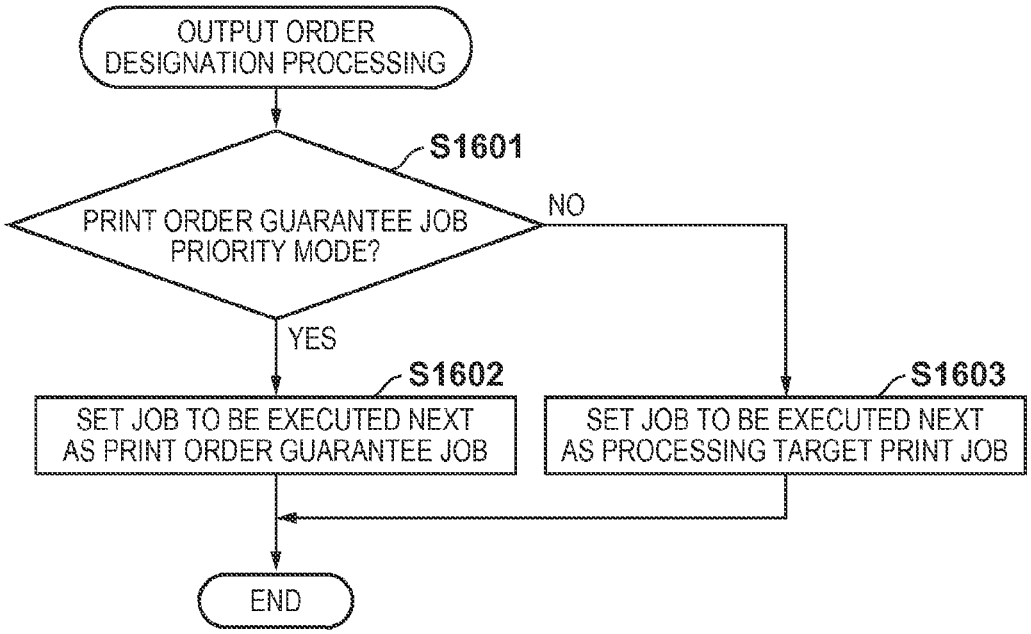

OUTPUT ORDER DESIGNATION PROCESSING
S1601
PRINT ORDER GUARANTEE JOB PRIORITY MODE?
NO
YES
S1602
SET JOB TO BE EXECUTED NEXT AS PRINT ORDER GUARANTEE JOB
S1603
SET JOB TO BE EXECUTED NEXT AS PROCESSING TARGET PRINT JOB
END

FIG. 17

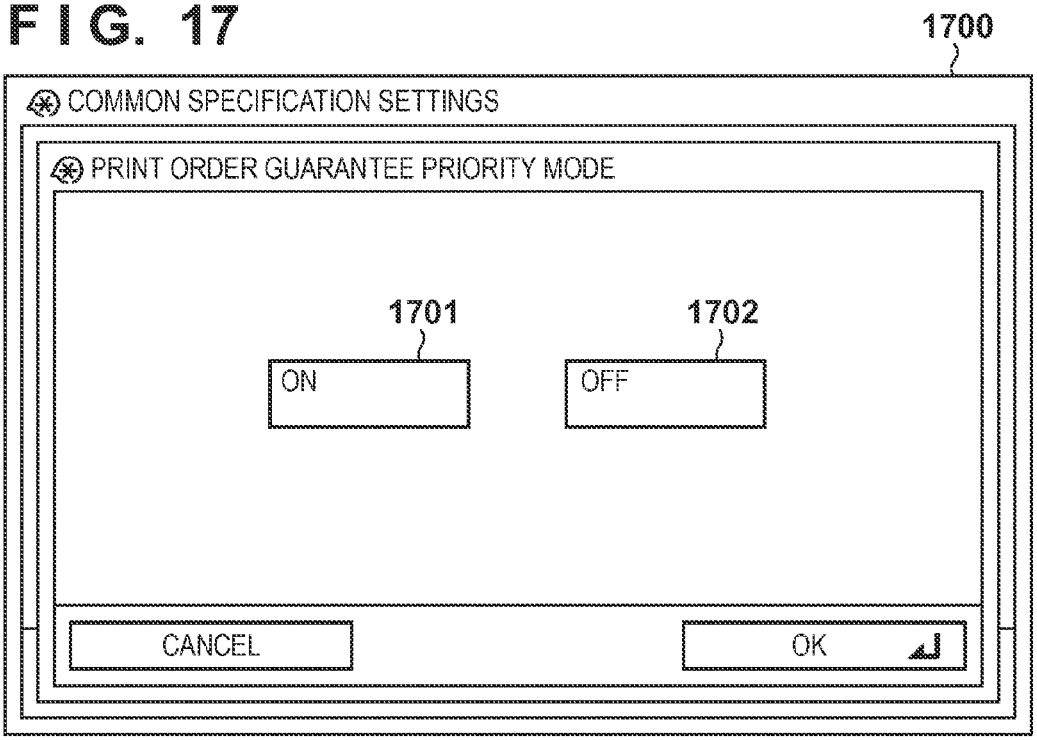
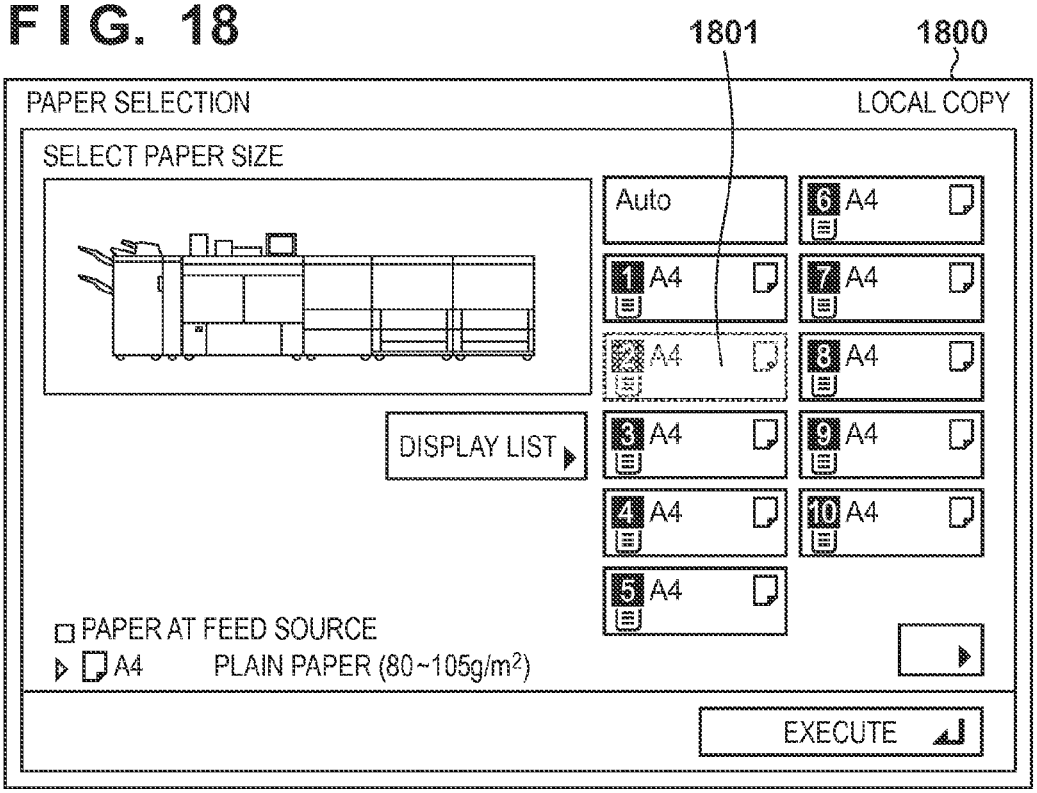

1700
COMMON SPECIFICATION SETTINGS
PRINT ORDER GUARANTEE PRIORITY MODE
1701
1702
ON
OFF
CANCEL
OK

FIG. 18


1801
1800
PAPER SELECTION
LOCAL COPY
SELECT PAPER SIZE
Auto
6 A4
1 A4
7 A4
A4
8 A4
DISPLAY LIST
3 A4
9 A4
4 A4
10 A4
5 A4
PAPER AT FEED SOURCE
A4 PLAIN PAPER (80~105g/m2)
EXECUTE

PRINTING APPARATUS, CONTROL METHOD THEREOF, AND STORAGE MEDIUM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a printing apparatus, control method thereof, and storage medium.

2. Description of the Related Art

When a printing apparatus continuously executes a plurality of print jobs, the time taken for reception processing generally varies between the respective print jobs depending on the data size of a print job received via a network. When the printing apparatus starts reception processing for the first print job of a large data size and then starts reception processing for the second print job of a small data size, the jobs may be executed in an order different from the one in which the reception processes have started. More specifically, if the reception processing for the second print job that has started later is completed before the completion of the reception processing for the first print job that has started first, the execution of the second print job may start before the first print job. In this manner, depending on the data size of a received print job, the printing apparatus does not always execute print jobs in an order in which the user input them to the printing apparatus.

However, it is known that the user of a production printing apparatus or the like has the following request. For example, for a print job which is executed by dividing it into a plurality of jobs in order to print a form, DM, or the like, it is desirable for the user to execute print jobs in an order in which he input them to the printing apparatus (that is, an external apparatus transmitted them to the printing apparatus). This is because the user wants to handle, as a series of products, a plurality of printed materials obtained as a result of executing a plurality of such print jobs.

As a technique for meeting this user demand, there is proposed a print order guarantee technique of, when the printing apparatus accepts a plurality of print jobs, guaranteeing the execution of them in an order in which the print jobs were accepted. For example, when the printing apparatus accepts a print job (to be referred to as a "print order guarantee job" hereinafter) for which the execution of print order guarantee is designated, it inhibits interruption by another job for which the execution of print order guarantee is not designated, and executes only the print order guarantee job. If the printing apparatus newly accepts a print order guarantee job in a predetermined period, it inhibits interruption by a job other than the print order guarantee job in a predetermined period further from that time. The printing apparatus repeats this operation, handles a plurality of accepted print order guarantee jobs as a job group, and executes the plurality of jobs included in the job group in the acceptance order. In this way, the printing apparatus implements the print order guarantee.

As described above, when executing the print order guarantee, the printing apparatus executes, in the acceptance order, a plurality of print order guarantee jobs accepted in a predetermined period. In this case, the printing apparatus inhibits the execution of a print job other than the print order guarantee jobs till the completion of the series of print order guarantee jobs. However, if the execution of another print job is inhibited without exception, the start of execution of another execution-inhibited job may be delayed more than necessary. Further, when print order guarantee jobs each having a relatively small data size and short execution time are executed at a given time interval, even if an idle time during which no job is executed is generated, no other job can be executed by using the idle time while the print order guarantee continues. In this case, the operation of the printing apparatus stops intermittently, greatly decreasing the productivity.

It is therefore desirable to execute another print job by interruption as much as possible during the execution of print order guarantee for a plurality of print jobs. Japanese Patent Laid-Open No. 2006-150732 discloses a method of, when a highest-priority job is different from a job in progress, temporarily stopping the job in progress and starting the execution of the highest-priority job. By using this method, for example, it is conceivable to execute a higher-priority print job by interruption during the execution of print order guarantee.

However, the conventional technique as described above has the following problems. When print jobs are executed by the above-described print order guarantee, if another print job is executed by interruption, this may influence the output order of a plurality of printed materials output by the print order guarantee. For example, if a printed material output by another print job is mixed in a plurality of printed materials output by the print order guarantee, the printed materials may not be output to the discharge destination in an output order intended by the user. Also, when the execution of a print job in progress is stopped, as described in Japanese Patent Laid-Open No. 2006-150732, the productivity may decrease owing to the time taken to switch the print job.

SUMMARY OF THE INVENTION

The present invention has been made to solve the above-described problems. The present invention provides a technique of increasing the productivity of a printing apparatus by allowing, during the execution of print order guarantee, the execution of a print job other than a specific print job for which the execution of print order guarantee is set, without disturbing the execution of the specific print job.

According to one aspect of the present invention, there is provided a printing apparatus comprising: an acceptance unit configured to accept a print job; a determination unit configured to, when the acceptance unit newly accepts a print job other than a specific job, for which guarantee of a print order is set as a print setting, during execution of print order guarantee for inhibiting execution of a print job other than the specific job and executing a plurality of specific jobs in an acceptance order, determine whether print settings of the print job include a setting which disturbs output of a printed material complying with print settings of a specific job in progress by the print order guarantee; and a control unit configured to, when the determination unit determines that the print settings of the print job do not include the setting which disturbs output of the printed material complying with the print settings of the specific job in progress by the print order guarantee, execute the print job by interrupt processing during execution of the print order guarantee.

According to another aspect of the present invention, there is provided a method of controlling a printing apparatus, the method comprising the steps of: accepting a print job; when a print job other than a specific job, for which guarantee of a print order is set as a print setting, is newly accepted during execution of print order guarantee for inhibiting execution of a print job other than the specific job and executing a plurality of specific jobs in an acceptance order, determining whether print settings of the print job include a setting which disturbs output of a printed material complying with print settings of a specific job in progress by the print order guarantee; and when the print settings of the print job are determined not to

include the setting which disturbs output of the printed material complying with the print settings of the specific job in progress by the print order guarantee, executing the print job by interrupt processing during execution of the print order guarantee.

According to still another aspect of the present invention, there is provided a computer-readable storage medium storing a computer program for causing a computer to execute steps of a method of controlling a printing apparatus, the method comprising the steps of: accepting a print job; when a print job other than a specific job, for which guarantee of a print order is set as a print setting, is newly accepted during execution of print order guarantee for inhibiting execution of a print job other than the specific job and executing a plurality of specific jobs in an acceptance order, determining whether print settings of the print job include a setting which disturbs output of a printed material complying with print settings of a specific job in progress by the print order guarantee; and when the print settings of the print job are determined not to include the setting which disturbs output of the printed material complying with the print settings of the specific job in progress by the print order guarantee, executing the print job by interrupt processing during execution of the print order guarantee.

The present invention can increase the productivity of a printing apparatus by allowing, during the execution of print order guarantee, the execution of a print job other than a specific print job for which the execution of print order guarantee is set, without disturbing the execution of the specific print job.

Further features of the present invention will become apparent from the following description of exemplary embodiments (with reference to the attached drawings).

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a view exemplifying the arrangement of a printing system **100**;

FIG. **2** is a view exemplifying the outer appearance of the printing apparatus **101**;

FIG. **3** is a block diagram exemplifying the control arrangement of the printing apparatus **101**;

FIG. **4** is a block diagram exemplifying the software arrangement of the printing apparatus **101**;

FIG. **5** is a flowchart showing the procedures of processing to be executed when a printing apparatus **101** accepts a print job according to the first embodiment;

FIG. **6** is a flowchart showing details of the procedures of interrupt print processing (step S**502**) according to the first embodiment;

FIG. **7** is a flowchart showing details of the procedures of print setting determination processing (step S**601**) according to the first embodiment;

FIG. **8** is a view exemplifying a warning screen displayed on an operation unit **201** in step S**603** according to the first embodiment;

FIG. **9** is a flowchart showing the procedures of processing to be executed when a printing apparatus **101** accepts a print job according to the second embodiment;

FIG. **10** is a flowchart showing the procedures of processing to be executed when a printing apparatus **101** accepts a print job according to the third embodiment;

FIG. **11** is a flowchart showing details of the procedures of consistency determination print processing (step S**1001**) according to the third embodiment;

FIG. **12** is a flowchart showing details of the procedures of consistency determination processing (step S**1101**) according to the third embodiment;

FIG. **13** is a view exemplifying a warning screen displayed on an operation unit **201** in step S**1103** according to the third embodiment;

FIG. **14** is a flowchart showing the procedures of processing to be executed when a printing apparatus **101** accepts a print job according to the fourth embodiment;

FIG. **15** is a flowchart showing the procedures of processing to be executed when a printing apparatus **101** accepts a print job according to the fifth embodiment;

FIG. **16** is a flowchart showing details of the procedures of output order designation processing (step S**1501**) according to the fifth embodiment;

FIG. **17** is a view exemplifying a setting screen for setting a print order guarantee priority mode according to the fifth embodiment; and

FIG. **18** is a view exemplifying a prohibition processing-applied setting screen according to the sixth embodiment.

DESCRIPTION OF THE EMBODIMENTS

Hereinafter, embodiments of the present invention will be described in detail with reference to the accompanying drawings. It should be noted that the following embodiments are not intended to limit the scope of the appended claims, and that not all the combinations of features described in the embodiments are necessarily essential to the solving means of the present invention.

<Printing System **100**>

A printing system to which embodiments to be described below are commonly applicable will be explained. FIG. **1** is a view exemplifying the arrangement of the printing system according to an embodiment of the present invention. A printing system **100** includes a printing apparatus **101** and client PC **102**. The printing apparatus **101** and client PC **102** are connected to be communicable via a network **103** such as a LAN or WAN. The network **103** can be a wired or wireless network.

The printing apparatus **101** has various functions such as the scan (reading) function, print (printing) function, and copy (copying) function. The client PC **102** has functions of creating, editing, and deleting an application file, and issuing a print instruction to the printing apparatus **101** via the network **103**. The user can use (operate) the client PC **102** to generate a print job for causing the printing apparatus **101** to print based on print data, and transmit the generated print job to the printing apparatus **101**. The user can also confirm the status of a job and the like in the printing apparatus **101** via the display unit of the client PC **102**.

<Hardware Arrangement of Printing Apparatus **101**>

FIG. **2** is a view exemplifying the outer appearance of the printing apparatus **101** according to the embodiment of the present invention. In embodiments to be described later, the printing apparatus **101** is an image forming apparatus such as a copying machine or multi-function peripheral (MFP). The printing apparatus **101** includes an operation unit **201**, a scanner unit **202**, a plurality of sheet feed units **203** and **204**, and a plurality of sheet discharge units **205** to **207**. Note that the printing apparatus **101** may be a single apparatus as shown in FIG. **2**, or an apparatus configured by combining a plurality of apparatuses.

The operation unit **201** accepts input of various instructions by the user to the printing apparatus **101**. The operation unit **201** includes hard keys, and a display unit such as a touch panel display. The scanner unit **202** reads (scans) an original

to generate electronic data (image data) corresponding to the image of the original. Sheets (printing materials) to print an image in the printing apparatus **101** are stacked on the sheet feed units **203** and **204**. By operating the client PC **102** or the operation unit **201** of the printing apparatus **101**, the user can select (designate), for each job to be executed by the printing apparatus **101**, which of the sheet feed units **203** and **204** supplies a printing sheet. Printed sheets are discharged to the sheet discharge units **205** to **207**. By operating the client PC **102** or the operation unit **201** of the printing apparatus **101**, the user can select (designate), for each job to be executed by the printing apparatus **101**, which of the sheet discharge units **205** to **207** a printed sheet is discharged to.

<Control Arrangement of Printing Apparatus **101**>

FIG. **3** is a block diagram exemplifying the control arrangement of the printing apparatus **101** according to the embodiment of the present invention. The printing apparatus **101** includes a system control unit **300**. The operation unit **201**, the scanner unit **202** serving as an image input device, and a printer unit **301** serving as an image output device are connected to the system control unit **300**.

The system control unit **300** controls the scanner unit **202** and printer unit **301** to input image data from the scanner unit **202** and output (print out) image data to the printer unit **301**. Also, the system control unit **300** controls the operation unit **201** to output (display and output) image data to the operation unit **201**. The printing apparatus **101** is connectable not only to the network **103** but also to a telephone line. The system control unit **300** transmits/receives (inputs/outputs) various data to/from an external apparatus (for example, the client PC **102**) via the network **103** or the telephone line.

The system control unit **300** includes a CPU **302**, RAM **303**, and operation unit interface (I/F) **304** as devices mutually connected via a system bus **316**. The system control unit **300** includes a network I/F **305**, modem **306**, ROM **307**, Hard Disk Drive (HDD) **308**, and image bus I/F **309**.

The CPU **302** is a central processing unit for controlling the overall printing apparatus **101**. The RAM **303** functions as a system work memory for operating the CPU **302**, and as an image memory for temporarily storing image data input via the scanner unit **202** or network I/F **305**. The ROM **307** is a boot ROM which stores the boot program of the system. The HDD **308** stores various data such as system software for various processes, and input image data.

The operation unit I/F **304** is an interface for connecting the operation unit **201** and system control unit **300**. The operation unit I/F **304** outputs screen data for displaying a screen such as an operation screen on the display unit of the operation unit **201**, receives, from the operation unit **201**, information (data) representing a user input accepted by the operation unit **201**, and transfers the information to the CPU **302**. The network I/F **305** is an interface which is formed from a LAN card or the like and connected to the network **103**. The network I/F **305** transmits/receives data to/from an external apparatus communicable via the network **103**. The modem **306** is connected to a telephone line, and transmits/receives data to/from an external apparatus communicable via the telephone line.

The image bus I/F **309** is an interface for connecting the system bus **316** and an image bus **317** capable of transferring image data at high speed, and is also a bus bridge for converting a data structure. The system control unit **300** includes a raster image processor (RIP) **311** and device I/F **312** as devices mutually connected via the image bus **317**. The system control unit **300** further includes a scanner image processing unit **313**, printer image processing unit **314**, image editing image processing unit **315**, and color management module (CMM) **310**.

The RIP **311** rasterizes page description language (PDL) data into a raster image. The device I/F **312** is an interface between the scanner unit **202** and the printer unit **301**, and performs synchronous/asynchronous conversion of image data transmitted/received between the scanner unit **202** and the printer unit **301**.

The scanner image processing unit **313** performs image processes such as correction, processing, and editing for image data which has been output from the scanner unit **202** and input via the device I/F **312**. The printer image processing unit **314** performs image processes such as correction and resolution conversion in accordance with the printing characteristics of the printer unit **301** for image data to be output to the printer unit **301**. The image editing image processing unit **315** performs image processes such as rotation of image data and compression/decompression of image data.

The CMM **310** is a dedicated hardware module which performs color conversion processing (also called color space conversion processing) based on a profile or calibration data for image data. The profile used by the CMM **310** is information such as a function for converting multicolor image data expressed in a device-dependent color space into image data in a device-independent color space (for example, Lab). The calibration data used by the CMM **310** is data for correcting the color reproduction characteristics of the scanner unit **202** and printer unit **301**.

<Software Module Arrangement of Printing Apparatus **101**>

FIG. **4** is a block diagram exemplifying the software module arrangement of the printing apparatus **101**. Software modules shown in FIG. **4** are stored as programs in the HDD **308**. The CPU **302** implements the functions of the respective software modules shown in FIG. **4** in the printing apparatus **101** by loading the programs stored in the HDD **308** into the RAM **303** and executing them.

A print job reception unit **401** receives a print job transmitted from the client PC **102**, and transfers the received print job to a print job management unit **402**. The print job management unit **402** performs control regarding a print job for the execution order of print jobs, the start of printing, save of a print job, and the like. A print job storage unit **403** is used to temporarily save a print job which has been transmitted from the client PC **102** and received by the print job reception unit **401**. In the embodiment described in this specification, the print job storage unit **403** corresponds to the HDD **308** or RAM **303**. That is, when data is stored in the print job storage unit **403**, it is stored in the HDD **308** or RAM **303** in fact.

A print processing unit **404** acquires a designated print job from the print job storage unit **403** in accordance with an instruction from the print job management unit **402**, and performs rasterization processing, image processing, and the like for image data for printing (print data) contained in the acquired print job. Further, the print processing unit **404** transmits image data for printing to the printer unit **301** via the device I/F **312**, and instructs the printer unit **301** to execute printing.

In accordance with an instruction from the print job management unit **402**, a print setting comparison unit **405** compares, between print jobs, print settings such as the feed source (sheet feed unit), discharge destination (discharge unit), and post-processing which are designated in different print jobs, and outputs the comparison result. A UI control unit **406** generates screen data for mainly displaying a screen on the display unit (liquid crystal panel) of the operation unit **201**, and performs display control to update the display screen in accordance with an input via the touch panel of the operation unit **201**. When an input obtained via the touch panel of

the operation unit **201** is equivalent to an execution instruction for a given job, the UI control unit **406** transfers the instruction to the print job management unit **402**. A device information acquisition unit **407** acquires, from respective devices related to printing, such as the printer unit **301**, sheet feed units **203** and **204**, and sheet discharge units **205** to **207**, information representing the states or use statues of the devices.

The printing apparatus **101** can execute the above-described print order guarantee. In the following embodiments, the print order guarantee means that the printing apparatus **101** inhibits the execution of a print job other than a print job (specific job) for which the guarantee of the printing order is set as a print setting, and executes a plurality of specific jobs in the acceptance order. (The "specific job" will also be called a "print order guarantee job", and the "print job other than the specific job" will also be called a "non-print order guarantee job".) Upon accepting a print order guarantee job, the printing apparatus **101** starts the execution of print order guarantee. More specifically, the printing apparatus **101** inhibits the execution (interruption) of a non-print order guarantee job for a predetermined period from the time when the print order guarantee job was accepted. If the printing apparatus **101** newly accepts a print order guarantee job in the predetermined period, it further inhibits the execution of a non-print order guarantee job in the predetermined period starting from that time. The printing apparatus **101** continues the print order guarantee as long as it accepts a print order guarantee job in the predetermined period. When the predetermined period has elapsed in a state in which no print order guarantee job is accepted, the printing apparatus **101** ends the print order guarantee.

On the premise of the above description, the first to sixth embodiments of the present invention will be explained. For descriptive convenience, the same reference numerals denote components or processing steps common between the embodiments, and a repetitive description thereof will be omitted as much as possible. Although the first to sixth embodiments can be practiced individually, one or more of them can also be practiced in combination.

First Embodiment

On the premise of a printing system **100** and printing apparatus **101** as described above, the first embodiment of the present invention will be described with reference to FIGS. **5** to **8**. Processes in the respective steps of flowcharts shown in FIGS. **5** to **7** are executed in the printing apparatus **101** as the functions of the respective software modules shown in FIG. **4** by loading programs stored in an HDD **308** into a RAM **303** and executing them by a CPU **302**.

FIG. **5** is a flowchart showing the procedures of processing to be executed when the printing apparatus **101** accepts a print job according to the first embodiment. In step S**501**, when a print job management unit **402** accepts a print job via a print job reception unit **401**, it determines whether the print order guarantee is being executed. If the print job management unit **402** determines that the print order guarantee is not being executed, it advances the process to step S**504**, instructs a print processing unit **404** to execute a processing target print job, thereby causing it to execute the print job in a normal way. If the print job management unit **402** determines that the print order guarantee is being executed, it advances the process to step S**502**.

In step S**502**, the print job management unit **402** determines whether the print job accepted in step S**501** is a print order guarantee job. If the print job management unit **402** determines that the accepted print job is a print order guarantee job, it advances the process to step S**504**. In step S**504**, the print job management unit **402** instructs the print processing unit **404** to execute the processing target print job (print order guarantee job), thereby causing it to execute the print job. If the print job management unit **402** determines in step S**502** that the print job accepted in step S**501** is not a print order guarantee job, it advances the process to step S**503**. In step S**503**, the print job management unit **402** executes interrupt print processing of executing a processing target print job under a predetermined condition in accordance with procedures shown in FIG. **6**.

<Interrupt Print Processing>

FIG. **6** is a flowchart showing details of the procedures of the interrupt print processing in step S**502**. First, in step S**601**, the print job management unit **402** causes a print setting comparison unit **405** to compare the print settings of the print order guarantee job (specific job) in progress with those of the processing target print job (non-print order guarantee job) that has been accepted in step S**501**. Further, the print job management unit **402** causes the print setting comparison unit **405** to execute determination processing based on the comparison result.

More specifically, the print setting comparison unit **405** determines whether the print settings of the processing target print job include a setting which disturbs output of a printed material complying with the print settings of the print order guarantee job in progress by the print order guarantee. If the print setting comparison unit **405** determines that the print settings of the processing target print job include a setting which disturbs output of a printed material complying with the print settings of the print order guarantee job, it generates determination information representing that the processing target print job cannot be executed. If the print setting comparison unit **405** determines that the print settings of the processing target print job do not include a setting which disturbs output of a printed material complying with the print settings of the print order guarantee job, it generates determination information representing that the processing target print job can be executed. Further, the print setting comparison unit **405** outputs the generated determination information to the print job management unit **402**. Note that the print setting determination processing in step S**601** can be executed in accordance with, for example, procedures shown in FIG. **7** (to be described later).

Then, in step S**602**, the print job management unit **402** determines, based on the result of determination by the print setting comparison unit **405**, whether the processing target print job (non-print order guarantee job) can be executed without influencing output of a printed material by the print order guarantee job in progress. If the print job management unit **402** determines that the processing target print job cannot be executed, it advances the process to step S**603**; if it determines that the processing target print job can be executed, to step S**606**.

In step S**606**, the print job management unit **402** (control unit) instructs the print processing unit **404** to execute the processing target print job, thereby executing the print job by interrupt processing during the execution of print order guarantee. The print processing unit **404** executes the processing target print job (non-print order guarantee job) by interrupt processing by executing the processing target print job before the start of execution of the next print order guarantee job upon completion of the print order guarantee job in progress. In this manner, while executing the print order guarantee, the

processing target print job can be executed by interruption without influencing output of a printed material by the print order guarantee job.

In step S603, the print job management unit **402** instructs a UI control unit **406** about display of a warning screen (warning UI) on the display unit of an operation unit **201**. In accordance with this instruction, the UI control unit **406** displays the warning screen on the display unit of the operation unit **201**. FIG. **8** exemplifies the warning screen displayed on the operation unit **201** in step S603, and is equivalent to a change screen for changing the print settings of a print job. On a warning screen **800** displayed on the operation unit **201**, the user selects to change the print settings of a processing target print job (non-print order guarantee job) and try the execution (interrupt processing) of the print job, or to wait for the completion of print order guarantee and execute the print job without changing the print settings. The UI control unit **406** transfers, to the print job management unit **402**, the user instruction input via the operation unit **201**. In step S604 to be described below, the print job management unit **402** determines, based on the information transferred from the UI control unit **406**, whether to execute interrupt processing for the processing target print job.

In step S604, the print job management unit **402** determines whether a user change instruction to change the print setting of the processing target print job has been accepted via the operation unit **201**. If the print job management unit **402** determines that no change instruction has been accepted (for example, when a cancel button **802** has been operated), it temporarily saves the processing target print job in a print job storage unit **403**, and ends the process. In this case, the print job management unit **402** reads out the print job from the print job storage unit **403** and executes it after the completion of the execution of print order guarantee in progress (all print order guarantee jobs). If the print job management unit **402** determines in step S604 that the change instruction has been accepted (for example, when a change instruction button **801** has been operated), it advances the process to step S605.

In step S605, the print job management unit **402** changes the print setting of the processing target print job in accordance with a user instruction further input via the operation unit **201**. Then, the print job management unit **402** returns the process to step S601 to repeat the above-described determination processing and change of print setting (steps S601 to S605). In steps S601 to S605, the print job management unit **402** tries interrupt processing for the processing target print job as long as the user inputs a print setting change instruction. If the changed print setting of the processing target print job is a setting which does not disturb output of a printed material complying with the print settings of the print order guarantee job in progress, the print job management unit **402** executes interrupt processing for the processing target print job. That is, the print job management unit **402** inserts the execution of the processing target print job (non-print order guarantee job) between the execution of one print order guarantee job and that of the next print order guarantee job.

If the print job management unit **402** determines in step S602 that the processing target print job cannot be executed, it may temporarily save the print job in the print job storage unit **403** without executing the processes in steps S603 to S605. In this case, the print job management unit **402** reads out the print job from the print job storage unit **403** upon completion of the execution of print order guarantee (all print order guarantee jobs), and causes the print processing unit **404** to execute it.

<Print Setting Determination Processing>

An example of the print setting determination processing in step S601 will be explained with reference to the flowchart shown in FIG. **7**. In step S701, the print setting comparison unit **405** determines whether a sheet discharge destination designated by the print setting of a processing target print job (non-print order guarantee job) overlaps a discharge destination designated by the print setting of a print order guarantee job in progress. If the print setting comparison unit **405** determines that the discharge destinations overlap each other, it advances the process to step S702; if it determines that the discharge destinations do not overlap each other, to step S703.

In step S703, the print setting comparison unit **405** determines whether a sheet feed source designated by the print setting of the processing target print job overlaps a feed source designated by the print setting of the print order guarantee job in progress. If the print setting comparison unit **405** determines that the feed sources overlap each other, it advances the process to step S702; if it determines that the feed sources do not overlap each other, to step S704.

If the process advances from step S701 or S703 to step S702, the print setting comparison unit **405** generates determination information representing that the processing target print job cannot be executed during the execution of print order guarantee, and outputs it to the print job management unit **402**. Accordingly, when at least one of the discharge destination and feed source designated by the print setting of the processing target print job overlaps the print setting of the print order guarantee job in progress, the print job management unit **402** determines that the print settings include a setting which disturbs output of a printed material by the print order guarantee. This is because an influence (to be described later) is exerted on a printed material output by the print order guarantee job.

In step S704, the print setting comparison unit **405** generates determination information representing that the processing target print job can be executed during the execution of print order guarantee, and outputs it to the print job management unit **402**. This is because, when the discharge destination and feed source designated by the print settings of the processing target print job do not overlap the print settings of the print order guarantee job in progress, the influence (to be described later) is not exerted on a printed material output by the print order guarantee job.

Upon completion of the processing in step S702 or S704, the print setting comparison unit **405** ends the print setting determination processing. Although FIG. **7** shows a case in which the print setting determination processing is performed in the order of setting of the discharge destination and setting of the feed source (steps S701 and S703), these determination processes may be performed in the reverse order. Alternatively, only one of these determination processes may be performed.

As described above, the printing apparatus **101** according to the first embodiment compares the print setting of a print job (non-print order guarantee job) other than a print order guarantee job, which serves as a candidate of execution by interrupt processing during the execution of print order guarantee, with the print setting of a print order guarantee job in progress. As a result of the comparison, when the print setting of the non-print order guarantee job is a setting which does not disturb output of a printed material complying with the print settings of the print order guarantee job in progress, the printing apparatus **101** executes the non-print order guarantee job by interrupt processing without changing the print settings. More specifically, the printing apparatus **101** executes the processing target non-print order guarantee job (between two print order guarantee jobs) before the start of execution of

the next print order guarantee job upon completion of the print order guarantee job in progress. Hence, the productivity of the printing apparatus can be increased by enabling a non-print order guarantee job to be executed during the execution of a print order guarantee job, for which the execution of print order guarantee is set, without disturbing the execution of this print order guarantee job.

When the print setting of the non-print order guarantee job is a setting which disturbs output of a printed material complying with the print settings of the print order guarantee job in progress, the printing apparatus **101** may display a warning screen and prompt the user to change the print setting of the non-print order guarantee job. Even in this case, the product (printed material) of the non-print order guarantee job can be output to a discharge destination reflecting the user's intention.

Application Example 1 of First Embodiment

The first application example of the first embodiment will be explained. As described above, when the printing apparatus **101** includes a plurality of sheet discharge units **205** as a plurality of discharge destinations, it can execute the following processing.

In the printing apparatus **101**, the following problem may occur if interrupt processing for a non-print order guarantee job is performed during the execution of print order guarantee without applying the first embodiment. For example, when the same discharge destination is designated for the print setting of a print order guarantee job and that of a non-print order guarantee job, printed materials output by the respective jobs mix at the same discharge destination. As a result, a plurality of printed materials based on a plurality of print jobs (print order guarantee jobs) are output to the discharge destination in an output order inconsistent with a desired printing order upon the execution of print order guarantee.

According to the first embodiment, the execution of a non-print order guarantee job by interrupt processing is permitted only when it does not influence output of a printed material complying with the print settings of a print order guarantee job. While preventing a mixture of printed materials output by a print order guarantee job and non-print order guarantee job at the discharge destination, interruption by the non-print order guarantee job during the execution of print order guarantee becomes possible. This increases the productivity of the printing apparatus.

According to the first embodiment, for example, the warning screen shown in FIG. **8** may be displayed to prompt a change of the print setting (discharge destination) of a non-print order guarantee job so that the printed material can be output to a discharge destination different from that of a print order guarantee job. Even when a discharge destination designated by the print setting of a non-print order guarantee job overlaps that of a print order guarantee job, interruption by the non-print order guarantee job during the execution of print order guarantee can be performed without influencing the print order guarantee job. Also, the product of the non-print order guarantee job can be output to a discharge destination reflecting the user's intention.

Application Example 2 of First Embodiment

The second application example of the first embodiment will be explained. As described above, when the printing apparatus **101** includes a plurality of sheet feed units **203** and **204** as a plurality of feed sources (feed trays), it can execute the following processing. For example, a case in which the user has set in advance a predetermined number of sheets in the specific sheet feed unit **203** in consideration of the number of sheets to be used in a print order guarantee job will be considered.

In the printing apparatus **101**, the following problem may occur if interrupt processing for a non-print order guarantee job is performed during the execution of print order guarantee without applying the first embodiment. For example, when the same feed source is designated for the print setting of a print order guarantee job and that of a non-print order guarantee job, printed materials not intended by the user may be output by the print order guarantee job. More specifically, when pre-printed sheets in a specific order have been set in the sheet feed unit **203** for a print order guarantee job, they may be used by executing the non-print order guarantee job by interrupt processing. As a result, the printing apparatus **101** cannot output a printed material complying with the print settings of the print order guarantee job as the user intended.

According to the first embodiment, the execution of a non-print order guarantee job by interrupt processing is permitted only when it does not influence output of a printed material complying with the print settings of a print order guarantee job. While preventing a non-print order guarantee job from using sheets set for a print order guarantee job, interruption by the non-print order guarantee job during the execution of print order guarantee becomes possible. This increases the productivity of the printing apparatus.

According to the first embodiment, for example, the warning screen shown in FIG. **8** may be displayed to prompt a change of the print setting (feed source) of a non-print order guarantee job so that sheets at a feed source different from that of a print order guarantee job can be used. Even when a feed source designated by the print setting of a non-print order guarantee job overlaps that of a print order guarantee job, interruption by the non-print order guarantee job during the execution of print order guarantee can be performed without influencing the print order guarantee job. In addition, a printed material by the non-print order guarantee job can be output by using sheets at a feed source reflecting the user's intention.

Second Embodiment

The second embodiment of the present invention will be explained with reference to FIG. **9**. FIG. **9** is a flowchart showing the procedures of processing to be executed when a printing apparatus **101** accepts a print job according to the second embodiment. The second embodiment is the same as the first embodiment (FIG. **5**) except that step S**901** is added.

In the second embodiment, a print job management unit **402** executes processing in step S**901** before advancing the process from step S**502** to step S**503**. More specifically, when the print job management unit **402** newly accepts a print job (non-print order guarantee job) other than a print order guarantee job during the execution of print order guarantee, it temporarily saves the print job in a print job storage unit **403**. In step S**901**, if a plurality of non-print order guarantee jobs are saved in the print job storage unit **403**, the print job management unit **402** compares priorities set for the respective jobs, and executes processing in step S**503** for the respective jobs in descending order of the priority. That is, the print job management unit **402** executes the above-described determination processing (step S**601**) for a plurality of already accepted non-print order guarantee jobs in accordance with the set priorities, and executes the jobs by interrupt printing based on the determination result.

In this fashion, the printing apparatus **101** according to the second embodiment can preferentially execute a high-priority job by interrupt processing even in a state in which a plurality of non-print order guarantee jobs wait for execution during the execution of print order guarantee. In the first embodiment, the printing apparatus **101** executes non-print order guarantee jobs in the acceptance order (in which reception was completed). To the contrary, according to the second embodiment, a job (non-print order guarantee job) having a temporal restriction, such as a schedule print job, can be executed preferentially by interruption, and processing reflecting the user's intention more faithfully can be performed.

Third Embodiment

The third embodiment of the present invention will be described with reference to FIGS. **10** to **13**. FIG. **10** is a flowchart showing the procedures of processing to be executed when a printing apparatus **101** accepts a print job according to the third embodiment. The third embodiment is the same as the first embodiment (FIG. **5**) except that, if the print order guarantee is determined not to be in execution in determination processing of step **S501** upon reception of a print job via a print job reception unit **401**, the process advances not to step **S504** but to step **S1001**.

In step **S1001**, a print job management unit **402** executes consistency determination processing for a printed material (product) present at a discharge destination designated by the print setting of a processing target print job that has been accepted in step **S501**, and controls the execution of the print job in accordance with the determination result.

<Consistency Determination Print Processing>

FIG. **11** is a flowchart showing details of the procedures of consistency determination print processing (step **S1001**) according to the third embodiment. In accordance with the use status of a discharge destination designated by the print setting of a processing target print job, the print job management unit **402** executes the print job without changing the discharge destination, displays a warning screen, or changes the print setting of the print job.

In step **S1101**, the print job management unit **402** instructs a print setting comparison unit **405** about the execution of consistency determination processing of determining whether executing a processing target (candidate) print job will influence the consistency of an already output printed material or a printed material to be output. If the print job management unit **402** receives determination information representing the result of the determination processing from the print setting comparison unit **405**, it advances the process to step **S1102**. Note that details of the determination processing in step **S1101** will be explained with reference to FIG. **12**.

In step **S1102**, the print job management unit **402** determines, based on the determination information obtained from the print setting comparison unit **405**, whether the processing target print job can be executed. If the determination information indicates chance of consistency loss of a printed material (product) by a print order guarantee job, the print job management unit **402** determines that the print job cannot be executed, and advances the process to step **S1103**. If there is no chance of consistency loss of a printed material by a print order guarantee job, the print job management unit **402** determines that the print job can be executed, and advances the process to step **S1107**.

In step **S1103**, the print job management unit **402** instructs a UI control unit **406** about display of a warning screen (warning UI) as shown in FIG. **13** on the display unit of an operation unit **201**. In accordance with this instruction, the UI control unit **406** displays the warning screen on the display unit of the operation unit **201**. FIG. **13** exemplifies the warning screen displayed on the display unit by the UI control unit **406** in step **S1103**. The user selects, via a displayed warning screen **1300**, to remove a printed material left at a displayed discharge destination (**1301**), to change the print setting of a processing target print job (**1302**), or to cancel the execution of a print job (**1303**). The UI control unit **406** transfers, to the print job management unit **402**, the user instruction input via the operation unit **201**.

In step **S1104**, the print job management unit **402** determines, based on the information from the UI control unit **406**, whether a user change instruction to change the print setting of the processing target print job has been accepted via the operation unit **201**. If the print job management unit **402** determines that the change instruction has been accepted (if the button **1302** has been operated), it advances the process to step **S1105**; if NO, to step **S1106**. In step **S1105**, the print job management unit **402** changes the print setting of the processing target print job in accordance with a user instruction further input via the operation unit **201**. Then, the print job management unit **402** returns the process to step **S1101** to repeat the above-described processing.

In step **S1106**, the print job management unit **402** determines whether a user instruction to remove a printed material left at the discharge destination has been accepted via the operation unit **201**. If the print job management unit **402** determines that the instruction has been accepted (if the button **1301** has been operated), it returns the process to step **S1101** to repeat the same processing as the above-described one. Meanwhile, the user can remove the printed material left at the discharge destination.

If the print job management unit **402** determines in step **S1106** that the above instruction has not been accepted (if the cancel button **1302** has been operated), it ends the process without executing the processing target job. This is because, if the processing target print job is executed while a printed material by a print order guarantee job remains at the discharge destination, the consistency of the printed material may be lost. If the print job is a print order guarantee job, the consistency of a printed material by this print order guarantee job may be lost owing to the printed material present at the discharge destination. Note that an unexecuted print job may be temporarily saved in a print job storage unit **403**. In this case, the execution of the print job can be tried again in accordance with an execution instruction by the user.

<Consistency Determination Processing>

FIG. **12** is a flowchart showing details of the procedures of the consistency determination processing (step **S1101**). In step **S1201**, the print setting comparison unit **405** determines, based on information obtained from a device information acquisition unit **407**, whether a printed material currently remains at a discharge destination designated by the print setting of a processing target. If the print setting comparison unit **405** determines that a printed material is present, it advances the process to step **S1202**; if it determines that no printed material is present, to step **S1205**.

In step **S1205**, the print setting comparison unit **405** generates determination information representing that the processing target print job can be executed, outputs it to the print job management unit **402**, and then ends the process. This is because, when no printed material is present at the discharge destination, the consistency of a printed material by a print order guarantee job is not influenced.

In step **S1202**, the print setting comparison unit **405** determines whether the processing target print job is a print order

guarantee job. At this time, the print setting comparison unit **405** executes the determination processing by confirming whether the execution of print order guarantee is set in the print setting of the print job obtained from the print job storage unit **403** via the print job management unit **402**. If the print setting comparison unit **405** determines that the processing target print job is a print order guarantee job, it advances the process to step S**1204**, generates determination information representing that the print job cannot be executed, outputs it to the print job management unit **402**, and then ends the process.

As a result, in steps S**1102** to S**1106**, the print job management unit **402** determines that the processing target print job cannot be executed, and inhibits the execution of the print job until the printed material present at the discharge destination is removed. This is because, if the print order guarantee job is executed while a printed material by another job remains at the discharge destination, the printed material by the other job and a printed material output by the execution of the print order guarantee job mix at the discharge destination. That is, the consistency of the printed material output by the print order guarantee job is lost. In such a case, according to the third embodiment, the execution of the print job is inhibited, preventing consistency of the printed material by the print order guarantee job from being lost.

If the print setting comparison unit **405** determines in step S**1202** that the processing target print job is not a print order guarantee job, it advances the process to step S**1203**. In step S**1203**, the print setting comparison unit **405** determines, based on the information obtained from a device information acquisition unit **407**, whether the printed material left at the discharge destination designated by the print setting of the processing target print job is a printed material by a print order guarantee job. If the print setting comparison unit **405** determines as a result of the determination processing that the printed material left at the discharge destination is not a printed material by a print order guarantee job, it advances the process to step S**1205**.

In step S**1205**, the print setting comparison unit **405** generates determination information representing that the processing target print job can be executed, outputs it to the print job management unit **402**, and then ends the process. This is because, if the printed material present at the discharge destination is not a printed material by a print order guarantee job, the consistency of the printed material by the print order guarantee job need not be considered.

If the print setting comparison unit **405** determines in step S**1202** that the printed material present at the discharge destination is a printed material by a print order guarantee job, it advances the process to step S**1204**. In step S**1204**, the print setting comparison unit **405** generates determination information representing that the print job cannot be executed, outputs it to the print job management unit **402**, and then ends the process.

As a result, in steps S**1102** to S**1106**, the print job management unit **402** determines that the processing target print job cannot be executed, and inhibits the execution of the print job until the printed material present at the discharge destination is removed. This is because, if the print job (non-print order guarantee job) is executed while a printed material by a print order guarantee job remains at the discharge destination, the printed material by the print job is output on the printed material by the print order guarantee job. That is, the consistency of the printed material already output by the print order guarantee job is lost. In such a case, according to the third embodiment, the execution of the print job is inhibited, preventing consistency of the printed material by the print order guarantee job from being lost.

When the execution of a processing target print job is inhibited, if a discharge destination designated by the print setting of the print job is changed to a different one as in steps S**1104** and S**1105**, the print job management unit **402** cancels the inhibition of the execution of the print job. In the third embodiment, if the process returns from step S**1105** to step S**1101** and it is determined in steps S**1101** and S**1102** that a print job can be executed, the inhibition of the execution of the print job is canceled.

As described above, the printing apparatus **101** according to the third embodiment determines whether the consistency of a printed material by a print order guarantee job is maintained not only during the execution of print order guarantee but also in a period (before the start or after the end of a print order guarantee job) in which the print order guarantee is not executed. According to the third embodiment, the consistency of a printed material by a print order guarantee job can be maintained even in a period in which the print order guarantee is not executed.

Fourth Embodiment

The fourth embodiment of the present invention will be described with reference to FIG. **14**. FIG. **14** is a flowchart showing the procedures of processing to be executed when a printing apparatus **101** accepts a print job according to the fourth embodiment. The fourth embodiment is the same as the first embodiment (FIG. **5**) except that, if it is determined in step S**502** that an accepted print job is not a print order guarantee job, the process advances not to step S**503** but to step S**1401**.

In the fourth embodiment, when a print job received via a print job reception unit **401** is a print order guarantee job, a print job management unit **402** executes only rasterization processing for the print job in step S**1401** without executing the print job by interrupt processing. Further, the print job management unit **402** temporarily saves the print job having undergone the rasterization processing in a print job storage unit **403**, and ends the process. The print job is executed after the end of print order guarantee.

In the first embodiment, only when a processing target print job does not include a setting which disturbs output of a printed material complying with the print settings of a print order guarantee job in progress, the print job is executed by interrupt processing by using an idle time during the execution of print order guarantee. However, for example, when many print order guarantee jobs have already been waiting for execution and the waiting print order guarantee jobs are to be preferentially executed, the timing to execute a newly accepted print job (non-print order guarantee job) may be greatly delayed. In such a case, according to the fourth embodiment, rasterization processing for the non-print order guarantee job is executed by using the idle time of rasterization processing for the print order guarantee jobs.

Even when a non-print order guarantee job cannot be executed in a state in which many print order guarantee jobs have already been waiting, the process for the job can be progressed. After the end of print order guarantee, the non-print order guarantee job can be executed in a short time, increasing the productivity of the printing apparatus.

Fifth Embodiment

The fifth embodiment of the present invention will be described with reference to FIGS. **15** to **17**. FIG. **15** is a

flowchart showing the procedures of processing to be executed when a printing apparatus **101** accepts a print job according to the fifth embodiment. The fifth embodiment is the same as the first embodiment (FIG. **5**) except that, if it is determined in step S**502** that an accepted print job is not a print order guarantee job, the process advances to step S**503** via step S**1501**.

If a print order guarantee job and non-print order guarantee job shift to the execution standby state at the same time during the execution of print order guarantee, the job of preference is considered to be different depending on the user. Considering this, according to the fifth embodiment, the printing apparatus **101** allows the user to set his or her job of preference.

More specifically, a print job management unit **402** instructs a UI control unit **406** to display, on the display unit of an operation unit **201**, a setting screen for setting, in accordance with a user operation, which of a print order guarantee job and non-print order guarantee job is preferentially executed. FIG. **17** exemplifies the setting screen for setting a print order guarantee priority mode. The user may operate a button **1701** via a displayed setting screen **1700** to give priority to a print order guarantee job, and a button **1702** to give priority to a non-print order guarantee job. The UI control unit **406** transfers, to the print job management unit **402**, the user instruction input via the operation unit **201**. Based on the information transferred from the UI control unit **406**, the print job management unit **402** sets in advance which of a print order guarantee job and non-print order guarantee job is preferentially executed.

Referring back to FIG. **15**, if the print order guarantee is being executed ("YES" in step S**501**) upon accepting a print job, and the accepted print job is a non-print order guarantee job ("NO" in step S**502**), the print job management unit **402** advances the process to step S**1501**. In step S**1501**, if a print order guarantee job has already been waiting for execution by the print order guarantee, the print job management unit **402** controls the execution order of the print order guarantee job and the newly accepted non-print order guarantee job. More specifically, the print job management unit **402** executes output order designation processing in accordance with procedures shown in FIG. **16**.

In step S**1601**, the print job management unit **402** determines, based on contents set in advance via the setting screen **1700**, whether a mode in which priority is given to a print order guarantee job has been set. If the print job management unit **402** determines that the mode in which priority is given to a print order guarantee job is set, it advances the process to step S**1602**, and sets a job to be executed next as a print order guarantee job. If the print job management unit **402** determines that the mode in which priority is given to a print order guarantee job is not set, it sets a job to be executed next as a processing target print job (non-print order guarantee job).

According to the fifth embodiment, even when many non-print order guarantee jobs shift to the standby state during the execution of print order guarantee, the job execution order can be controlled so that a non-print order guarantee job is preferentially executed.

Sixth Embodiment

The sixth embodiment of the present invention will be described with reference to FIG. **18**. A difference from the above-described embodiments will be mainly explained. A printing apparatus **101** can execute not only a print job transmitted from a client PC **102** but also, for example, a job set by using an operation unit **201** of the printing apparatus **101**. However, when such a job is newly set, the newly set job may disturb output of a printed material complying with the print settings of a print order guarantee job in progress, similar to the above-described embodiments.

In the sixth embodiment, when the user sets a job and inputs an execution instruction via the operation unit **201** during the execution of print order guarantee, the printing apparatus **101** controls display of the setting screen not to allow a setting which disturbs output of a printed material by a print order guarantee job.

A print job management unit **402** instructs a UI control unit **406** to display a job setting screen on the display unit of the operation unit **201** in accordance with a user operation. FIG. **18** exemplifies a prohibition processing-applied setting screen for making settings for a copy job. When the print order guarantee is being executed, the print job management unit **402** applies prohibition processing to a setting screen **1800** displayed on the display unit, not to allow a setting which disturbs output of a printed material complying with the print settings of a print order guarantee job.

For example, when displaying the setting screen **1800** for making settings for a copy job during the execution of print order guarantee, the print job management unit **402** performs the following control. More specifically, the print job management unit **402** controls display of the setting screen **1800** so that at least either of the settings of the discharge destination and feed source of sheets for the copy job does not become the same as the print setting of a job in progress by the print order guarantee. This control can be executed by graying out a button (for example, a button **1801**) corresponding to a setting to be prohibited, as shown in FIG. **18**.

In the sixth embodiment, even for a print job such as a copy job set in the main body of the printing apparatus **101**, it is prohibited to make a setting which disturbs output of a printed material by a print order guarantee job at the stage of print setting. Even in this case, according to the sixth embodiment, output of a printed material by a print order guarantee job can be prevented from being disturbed.

Other Embodiments

Aspects of the present invention can also be realized by a computer of a system or apparatus (or devices such as a CPU or MPU) that reads out and executes a program recorded on a memory device to perform the functions of the above-described embodiment(s), and by a method, the steps of which are performed by a computer of a system or apparatus by, for example, reading out and executing a program recorded on a memory device to perform the functions of the above-described embodiment(s). For this purpose, the program is provided to the computer for example via a network or from a recording medium of various types serving as the memory device (for example, computer-readable medium).

While the present invention has been described with reference to exemplary embodiments, it is to be understood that the invention is not limited to the disclosed exemplary embodiments. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures and functions.

This application claims the benefit of Japanese Patent Application No. 2012-207527, filed Sep. 20, 2012, which is hereby incorporated by reference herein in its entirety.

What is claimed is:

1. A printing apparatus comprising:

a determining unit configured to determine, in a case where another type of job other than a specific type of job is received before a predetermined time has elapsed after the specific type of job is received, whether a discharg-

ing destination of the another type of job is the same as a discharging destination of the specific type of job;

a restricting unit configured to restrict, in a case where the determining unit determines that the discharging destination of the another type of job is the same as the discharging destination of the specific type of job, execution of the another type of job between the specific type of job and a next specific type of job received before the predetermined time has elapsed; and

an executing unit configured to execute, in a case where the determining unit determines that the discharging destination of the another type of job is not the same as the discharging destination of the specific type of job, the another type of job between the specific type of job and the next specific type of job received before the predetermined time has elapsed.

2. The printing apparatus according to claim **1**, further comprising

a notification unit configured to notify a user of a factor of the restriction by the restricting unit in a case where the restricting unit restricts the execution of the another type of the job.

3. The printing apparatus according to claim **2**, wherein the factor of the restriction includes the discharging destination of the another type of job.

4. The printing apparatus according to claim **1**, further comprising

a changing unit configured to change, based on an instruction received from a user, the discharging destination of the another type of job in a case where the restricting unit restricts the execution of the another type of the job.

5. The printing apparatus according to claim **1**, wherein the specific type of job is a job for which guarantee of a print order is set.

6. A control method for controlling a printing apparatus comprising:

determining, in a case where another type of job other than the specific type of job is received before a predetermined time has elapsed after a specific type of job is received, whether a discharging destination of the another type of job is the same as a discharging destination of the specific type of job;

restricting, in a case where it is determined that the discharging destination of the another type of job is the same as the discharging destination of the specific type of job, execution of the another type of job between the specific type of job and a next specific type of job received before the predetermined time has elapsed; and

executing, in a case where it is determined that the discharging destination of the another type of job is not the same as the discharging destination of the specific type of job, the another type of job between the specific type of job and the next specific type of job received before the predetermined time has elapsed.

7. A non-transitory computer readable storage medium for storing a computer program for controlling a printing apparatus, comprising:

a code to determine, in a case where another type of job other than the specific type of job is received before a predetermined time has elapsed after a specific type of job is received, whether a discharging destination of the another type of job is the same as a discharging destination of the specific type of job;

a code to restrict, in a case where it is determined that the discharging destination of the another type of job is the same as the discharging destination of the specific type of job, execution of the another type of job between the specific type of job and a next specific type of job received before the predetermined time has elapsed; and

a code to execute, in a case where it is determined that the discharging destination of the another type of job is not the same as the discharging destination of the specific type of job, the another type of job between the specific type of job and the next specific type of job received before the predetermined time has elapsed.

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